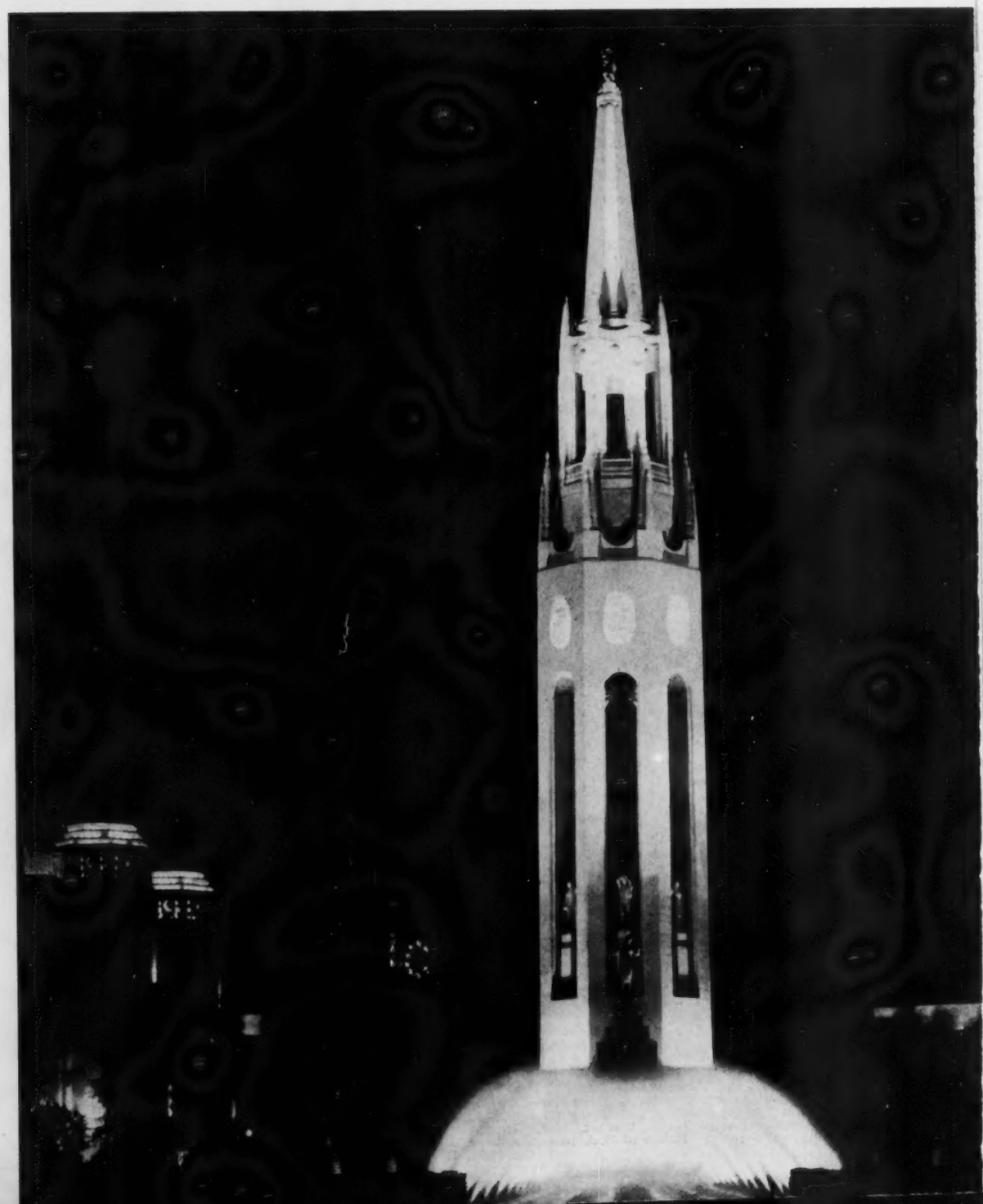
ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS



1939 GOLDEN GATE INTERNATIONAL EXPOSITION

25c a Copy

JAN. 1939

McGraw-Hill Co. of Calif.

TK1
.E495

Can anything be CLEANER than a modern ELECTRIC RANGE?
Could anything be MORE MODERN than an ELECTRIC RANGE ?
COULD anything be FASTER than a modern ELECTRIC RANGE ?
Now KITCHENS FOR OLD
Edison
Get AN ELECTRIC RANGE

Edison Advertising

SELLS ELECTRIC RANGES AND ELECTRIC WIRING, TOO

Edison advertising in 200 daily and weekly newspapers is doing its part toward causing hundreds of home-owners to switch to electric cooking each month. But the effect doesn't stop there.

Every range sold means a wiring job, too, so the contractor benefits equally from this activity. And the same thing is true to a lesser degree in Edison's other appliance advertising because the more appliances sold, the greater the need for more wiring facilities.

Twenty years ago, one outlet per room was considered sufficient for the average small home. Today three or four double outlets are needed to make that same home comfortable according to modern living standards.

Consumer education is responsible for this change,—an activity in which Edison advertising has played a consistently important part.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

1-39

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), January, 1939, Vol. 82, No. 1. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
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COSTS IN HALF!

were sawed

For an outlay of $85.00, the Shell representative showed this company how to cut costs in half

ELECTRICITY for the entire 5-acre Hutton & Bourbonnais Co. plant in Hickory, North Carolina, is generated by means of a 550-H. P. compound steam engine.

The mill had experienced great difficulty in lubricating this engine and decided to call in a Shell representative to work on the problem.

The Shell man went to work . . . made a survey of operating conditions . . . saw where the trouble lay. "You can lick this trouble for about $85.00," he said. That $85.00 was an investment in new equipment for the engine. "Couple that equipment with the right grade of Shell Wolco Oil for this application . . . and we'll have the answer," was the engineer's prediction.

The new system and lubricant were put in use and found satisfactory in every respect. According to Mr. G. N. Hutton: "Through the expenditure of about $85.00 for recommended equipment, we have been able to cut down our steam-cylinder oil expense by about 56 per cent."

• • •

The outstanding job done by the Shell man for this mill is being repeated day after day in mills, mines and factories all over the country. When faced with a tough problem of industrial lubrication, *call on the men who get results!* Simply phone or write your nearest Shell office.

SHELL INDUSTRIAL LUBRICANTS

HW. 6/21/40

BETWEEN THIS MONTH'S COVERS

Be Proud

Building Pride to Develop Goodwill (p. 19): The soundest public relations are those established by a staff of employees who are sincerely sure they are working for the best boss in the greatest company in the finest industry. This being the case, says Author A. E. Hitchener, Los Angeles district manager of Westinghouse and president of the PCEA, "it is inexcusable that there should be any public relations problem within the electrical industry." Hitchener's formula for good public relations is Company Pride plus Industry Pride.

More Friends

This Job of Friend-Making (p. 20): Over a 60-year period, electric power has been a vital factor in increasing factory horsepower 14 times; factory employment, 3 times; factory wages, 11 times. . . . Elmer Boyne, a Sierra Pacific Power Co. meter reader, makes friends for his company simply by treating the customers he meets as friends, by explaining what their electric service means to them and by describing the basis on which bills are made out. . . . Every month Puget Sound Power & Light impresses its customers with the low cost of electricity. This is done by cashiers who fill out forms showing each customer how his bill is computed.

Spanning the Bay

Power for Bay Bridge Trains (p. 22): Controlled by a cab signalling system which automatically limits their speed, and served by substations which are operated automatically from a central point, trains start operating this month across the 8¼-mi. Bay Bridge. Thus completing the spanning of San Francisco Bay, they will carry some 50,000 daily passengers back and forth to work. Electrifying this 20 mi. of main line and 12 mi. of siding has been an $18,000,000 job. Pacific Gas and Electric Co. will service the load through substations located at the ends and middle. Twelve-thousand volt alternating current will be converted to direct current by means of steel-tank mercury-arc rectifiers which constitute a unique installation for the region, although such equipment is standard for serving d.c. loads. Two types of trains will operate over the same tracks, one using a 625-volt third rail, the other a 1,300-volt overhead.

Better Selling

Sales Parade (p. 29): G. A. Noonan, one of Portland's best salesmen, always asks a prospect to make a $1 deposit on the range she likes. Then he tells her to visit other stores and compare his range with the best some one else has to offer. Radical as these selling tactics are, Noonan has proof that 90% of these depositors turn into buyers. . . . After a survey of 2,447 approved electric water heaters on its system, Los Angeles Bureau of Power & Light evolved the following rule for use in water-heater promotion: The average monthly water-heater kw.-hr. consumption is equal to 40 times the number of persons served plus 135 times the number of bathrooms. . . . Because the best method of correcting mistakes in a sales talk is to let the speaker hear himself talk, Idaho Power Co. is now using portable recording equipment on all its sales persons. After presenting their talks for recording, salesmen sit back and listen to the way they sound. Results have been tremendous. . . . When the Washington State Highway Dept. finally discovered how much time it was wasting in loading viscous asphalt road material from an uninsulated storage tank into distributing trucks, it began to consider the installation of some heating device to keep the asphalt flowable. Puget Sound Power & Light furnished the answer with electric heat. Now the required 160-deg. tank temperature is constantly maintained; many man-hours are saved, and operating and maintenance costs are reduced.

No More Bottleneck

Through the Wrong End of the Telescope (p. 42) by C. A. Rowley: In Southern California Edison territory 10,000 new homes are each year eliminated from the heavy-duty appliance prospect list because they are not adequately wired. Obviously the situation is bad. Author Rowley offers a solution by dividing the houses into three groups. Cost of the service-entrance wiring job in Group I (smallest houses) he figures at $20. If the industry would raise this price to $57 and include capacity for all necessary future circuits, it would stand to earn not only the extra $37 but also $440 for appliances which might then be installed and $73 annually for central station service. The scheme is far from the crack-pot class. Rowley was for many years an electrical contractor in Pasadena. During that time he conducted classes on electrical design and specifications for young architects. Two years ago he sold his business and joined Thermador Electric Mfg. Co. as engineering salesman.

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Contractor's Letter

Dear Bill (p. 44): Few contractors have the time to write a long sales letter to a prospect. The most they do is to set down a price. Here, however, is a contractor (anonymous) who took the time and used it to good advantage in writing a friend who was building a home. "I figure you should be able to get your electric work for $110 to $125," he writes. He then outlines the items which provide real home comfort: "It is essential that your specifications include a clause for the installation of door-bells. . . . How about a radio plug?"

Electrical Farming

Rural Loadbuilding (p. 49): To provide sufficient fresh air in poultry houses and at the same time eliminate drafts and produce an even temperature between floor and ceiling, a Washington farmer has mounted a motor-driven ventilating fan and a 2.5-kw. heating unit in an opening in the ceiling. . . . Four old river-boat boilers are now used to supply hot water to employees of Mandeville Island Farms, Inc. They represent an added water-heating load of 180 kw.

Coming Up

Next Month: As usual, ELECTRICAL WEST will publish its Annual Review and Progress Number. This is the 20th. Outlined and interpreted are all the important events of 1938; also the forecast for 1939. Here's the guide to the Far West's $250,000,000 market.

INSTALL G-E HOME WIRING* FOR LARGER WIRING JOBS FOR SATISFIED CUSTOMERS

Now is the time to sell G-E Home Wiring*. Many new homes are being built. Much publicity is being given to the desirability of adequate wiring. New home owners want to use the many electrical appliances available today so they will pay attention to your recommendations for necessary wiring. Speculative builders can make good wiring a strong selling point.

Installing G-E Home Wiring* is one sure way of giving your customers the freedom in using electricity that they want. G-E Home Wiring* is adaptable for any size or type of house and will meet all local conditions and requirements. It assures continuing satisfaction because it will be adequate to care for future as well as present needs. Houses with G-E Home Wiring* stay young.

For further information about G-E Home Wiring* or about G-E Wiring Materials (there is a complete line) see your nearest G-E Merchandise Distributor or write to Section CDW-971, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

**G-E Radial Wiring System*

GENERAL ELECTRIC

ADEQUATE WIRING SERVES AND SAVES

KLEIN
"Lightweight"
CLIMBERS

Klein "Lightweight" Climbers are built to the minimum weight possible consistent with maximum safety. Every pair is tested exactly the same as are the old time tried Standard Climbers. The lineman can throw his weight on these climbers with confidence —they are Klein's!

DISTRIBUTED THROUGH JOBBERS

Foreign Distributor: International Standard Electric Corp., New York

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

- ☐ Lightweight Climbers.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ Klein Kord Fabric Safety Straps.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 Chicago, Ill. U.S.A.
3200 BELMONT AVENUE

NEW PRODUCTS

Stow-a-way Laundry

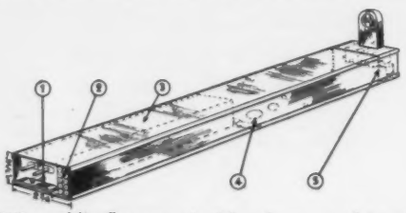
Stow-a-way is the very descriptive name of Thor's new kitchen laundry. Requiring a storage space of only about 8 cu. ft., the laundry is designed for use in the bathroom or kitchens of small homes. The unit, which is square, has no protruding edges. It fits under almost any table. Yet it includes a washer, wringer and regular-length, light-weight ironer (which is stored separately in any niche or closet). Adjustable legs, which slide up into the body of the washer, permit housewife to raise machine to any required height. The washer can handle 35 lb. of clothes per hour. It is equipped with agitator, having three lower and six side fins, and motor-driven emptying pump. Motor-driven aluminum wringer stows away out in sight in compartment at rear of cabinet. Standard 26-in. ironer can be quickly attached to washer in place of wringer. It is driven by washer motor and shaft. Hurley Machine, the manufacturer, stresses the fact that no oiling is necessary any where, any time.

Straight-Line Dead Ends

New line of automatic dead ends with flexible clevis for use with strain or spool insulators has been designed by Reliable Electric Co. The straight-through type permits easy takeup of slack and latches into a compact one-piece assembly. The splice adapter offers economy in stocking since it permits dead ending with a standard automatic splice. The dead ends will hold the strength of the line wire. Both types are made of copper and bronze alloys and are easily installed.

Fluorescent

Advent of fluorescent light has brought forth a deluge of equipment announcements. These include the following: Litecontrol Corp.'s "Daytube" units for standard and industrial applications. Standard type has closed ends; industrial type, open ends. Each is furnished in six sizes and two finishes. Miller Co.'s reflectors for use with fluorescent Mazda

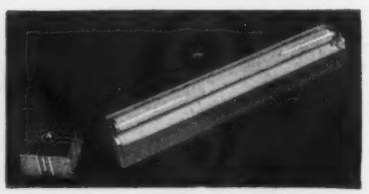


Wiremold's fluorescent strip. Arrows point out important features

lamps. These come in a variety of styles. Operating reactor is built into the channel reflector, which suspends over bench, desk, etc., and has convenient toggle switch. Bryant Electric Co.'s lampholder for surface or flush mounting. Only one screw and nut are used for mounting. Bakelite cover plate provides protected wiring on installations. Benjamin Electric Mfg. Co.'s daylight fluorescent lamp diffusers. Each unit is arranged for three lamps. The 36-in. size uses 30-watt lamps providing 36 lumens per watt; 18-in. size uses 15-watt lamps rated 30 lumens per watt. Wiremold Co.'s fluorescent strip. Auxiliary clamp of the strip holds any standard thermal-type auxiliary coil in the raceway. With the coil in place, raceway has capacity for ten No. 12 R.C. conductors. Base of the strip has wood screw knockouts on 8-in. centers. Snap-in receptacle clamp provides means for wiring and holding any standard lamp receptacle in

Litecontrol's industrial-type "Daytube"

channel. Visualite Corp.'s fluorescent lighting fixture. Made in three sizes, the fixture contains 80 ft. of fluorescent tubing. Light intensity furnished is 100 ft.-candles. Curtis Lighting's fluorescent strip. Reflectors are to be used when increased lighting efficiency or directional lighting are important. Reflectors of Alzak aluminum are available either in symmetric or asymmetric shape. F. W. Wakefield Brass Co.'s equipment. This is such that



Wakefield Brass' equipment

lamps can be interconnected in any number of patterns simply by using standard units complete with connectors. Reflector is shaped in the form of a double parabola.

Ohmmeter

Ohmmeter with ranges from 0.2 to 300 megohms has been introduced by Weston Electrical Instrument Corp. This is designed for use where resistance measurement requirements call for broad coverage plus constancy in operation. Only 50 microamp. are required for full-scale deflection. Operating from an a.c. 60-cycle supply, the instrument can be used without variation in results because of the line voltage control on a.c. circuits with a voltage from 105 to 130. Test circuit has been isolated from the a.c. line in order to prevent shocks when external leads are employed. Filament-type vacuum tube is used as a rectifier.

Service Light

Designed to eliminate dark corners in workshops and provide concentrated spot lighting for detail work is Lumidor Mfg. Co.'s new service light. With one hand the workman may adjust the height of the light from 3 to 6 ft. Reflector swings in a 240-deg. arc and completely rotates. The 9-in. reflector is protected by a heavy wire guard. All sizes of standard base lamps are accommodated in a code receptacle. An anti-strain mounting supports 25 ft. of rubber cord plus a hanger which retains the cord when not in use.

Compact Range

For the pocket-size kitchen, General Electric has produced a new electric range but 19½ in. in width. Embodied in the unit are a large, automatic oven and three Calrod surface units (one of which has five heats). Range is built for flush installation against the wall and adjacent to cabinets. No external pipes, hoods or vents are needed.

Mercury Arc Rectifier

A small capacity, permanently evacuated rectifier unit using a substantial, heat-resistant glass bulb as a vacuum chamber has just been

(Continued on Page 8)

IT MUST BE RIGHT

smooth sailing with TRIANGLE

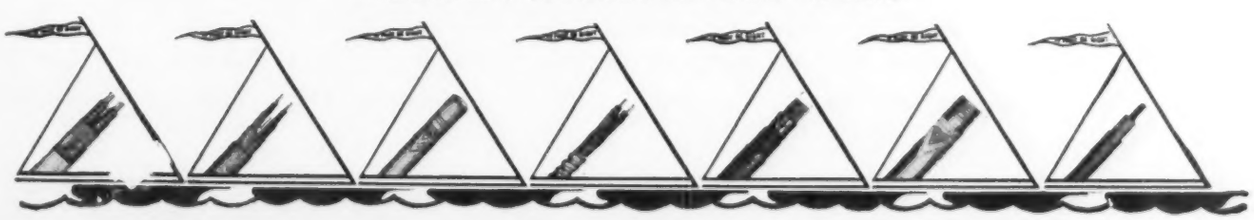
TRIANGLE PRODUCTS GO PLACES

TRIANGLE IS THERE!

—with a leading distributor next door to your job

Insist upon Triangle Products for Service, Savings and Satisfaction

TRIANGLE PRODUCTS REWARD BUYERS



TRIANGLE CONDUIT & CABLE COMPANY, INC.

Horace Harding and Queens Blvds.
Elmhurst, New York City, N. Y.

Pacific Coast Division: C. C. Hillis, Vice-President in Charge of Sales, 390 Seventh St., San Francisco, California

The G-E SPIRAKORE

cores wound

For Better Performance—
Lower Prices, Too

YOU asked us to build you a lower-priced distribution transformer that would be just as good as those we have been supplying you.

The G-E SPIRAKORE transformer accomplishes all this through a revolutionary development which permits us to wind cores with great rapidity from a ribbon of continuous cold-rolled steel strip possessing superior magnetic characteristics.

It has higher efficiency at heavy load; it has lower exciting current and better voltage regulation; it is easier to handle because of its lighter weight; AND it is more economical to manufacture.

It is always possible to lower prices by such temporary expedients as the use of lower-quality materials or less careful methods of manufacture. The SPIRAKORE development utilizes not only new and better materials, but an even more precise and effective method of manufacture. It is a fundamental and permanent step forward that inevitably will have a far-reaching influence in the transformer field.

If you are already familiar with this development, you probably realize that it represents the greatest measurable benefit in recent years in the field of distribution. You have undoubtedly sensed, too, that it is only the beginning—that much more can be expected from the application of G-E research and engineering to this promising new discovery.

G-E SPIRAKORE transformers, which can be identified by the red spiral on the tank, are available in single-phase, 60-cycle ratings, $1\frac{1}{2}$ and 3 kva, 7620 volts and below, and $2\frac{1}{2}$ kva, 11,500 and 13,200 volts. Other ratings can be expected as rapidly as good engineering and thorough testing will permit.

Ask your General Electric representative for further details, and begin now to specify SPIRAKORE transformers. General Electric, Schenectady, New York.

GENERAL ELECTRIC

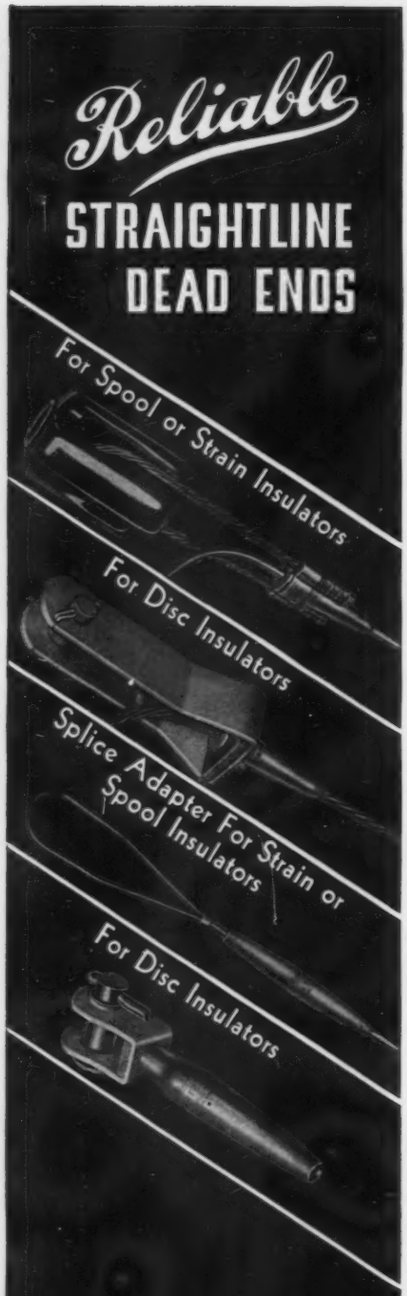
TRANSFORMER

in a spiral

G-E SPIRAKORE TRANSFORMERS CAN BE IDENTIFIED BY THE RED SPIRAL ON THE TANKS

CORE-AND-COIL ASSEMBLY FOR NEW SPIRAKORE TRANSFORMER

Reliable
STRAIGHTLINE DEAD ENDS



Flexible clevis Straight-Thru type FD — A compact and convenient low cost unit.

Long rigid clevis Straight-Thru type LD — Sturdy and easily handled.

Straightline Splice adapter type DD — For economy in stocking.

Rigid clevis type D — Compact and economical.

Reliable Straightline Dead Ends include design features of the Straightline Splice. Straight-Thru type permits easy take-up of slack.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE · CHICAGO ILLINOIS

put on the market by Allis-Chalmers. The unit requires neither vacuum pumps, vacuum gages nor cooling water, since it is air cooled by a small fan. Complete unit consists of the glass bulb, resiliently mounted in a readily accessible truck-type framework located waist high in the upper portion of the cubicle structure. Lower portion contains the cooling fan and the small panel supporting the ignition and excitation devices. Necessary transformers and circuit breakers may be placed adjacent to the cubicle. Sizes range from 50 kw. at 250 volts to 300 kw. at 600 volts.

Low-Water Cutout

A simple method for automatically turning off fuel burners when boiler water becomes dangerously low is provided in General Controls' all-electric, low-water cutout. It is adapted for quick installation between regular gage glass and coal, oil or gas-fired furnaces. Device consists of a mercury relay of the rotating armature type which is actuated by current conducted by water in the electrode chamber. A level differential exists between the cut-in point and cut-out point by virtue of relay characteristics which require more current to pull in than to drop out. Electrode current is nominal, being but a few hundredths of an ampere. and permits use of 24 volts on electrode.

Speaking Microphone

With one of Connecticut Telephone & Electric Corp.'s master speaking microphones the busy executive can keep in touch with all parts of his organization without leaving his desk. The instrument may be connected with two or more stations. Using the ordinary conversational tone, the executive may talk into the instrument without getting close to it. He may talk with any or all of the stations at one time. All parts af the system are portable and easily installed. A two-way system, for instance, is composed of two microphone receivers connected to an amplifying unit which is plugged into the nearest outlet. All instruments are simple, neat, compact.

Insect Killer

Bugs don't stand a chance when a new electric-ray insect killer employing the penetrating sections of an infra-red ray generated by a specially designed light bulb and filament is used on them. At least, so says the manufacturer, Leray Corp. The bulb, housed in a cone-shaped container of spun steel, sheds a brilliant spot of light which spells sudden death for fleas, ants, moth-larvae, plant insects, etc. The killer is held in the hand and works from any a.c. or d.c. outlet. Its action is said to be instantaneous; its operation, clean and simple. One especially fine use for the killer is in defleaing a dog or cat.

Garbage Disposal

"In-Sink-Erator" is the name of a garbage disposal unit introduced by the company of that name. Readily attached on any sink, the unit requires only 16 in. from outlet to base of unit. It consists of a tubular chamber, attached directly to the sink, into which all refuse is placed. (A special opening prevents the user from getting his hand into the device.) In the lower end of the chamber an electrically operated cutter head reduces the garbage to fine particles. This head is mounted on the armature shaft and is the only moving part of the unit. It can operate in either forward or reverse direction. The ¼-hp. motor is equipped with a safety switch to protect it from damage.

Electric Blanket

After eleven months of testing, Underwriters' Laboratories has approved General Electric's electric blanket. Best indication that the blanket is now considered safe is the recent introduction of a crib-size blanket.

PRODUCT DATA

Free to you . . . Any of these instructive bulletins simply by addressing a post card to ELECTRICAL WEST and asking for the desired bulletin by number.

101:
THREE BULLETINS on various kinds of switches represent Bowie Switch Co.'s contribution to the new literature parade. No. 24 covers distribution and rural switches (disconnecting switches, hook-stick operated, and air-break switches, rockershaft group operated); No. 25 covers NEMA rockershaft air-break switches; No. 26 covers outdoor switches, hook-stick operated. All bulletins are complete with descriptions and illustrations and plenty of diagrams and specifications. You can have them all by asking ELECTRICAL WEST for No. 101. Or, if you want only one, specify which number.

102:
COPPERWELD STEEL CO. has released an eight-page data booklet containing tabular information on the physical properties of guy strand, some notes on installation practices and a convenient graphical method of determining the required strength of guys. The title is "Non-Rusting Guy Strand for Overhead Line Construction." Write for bulletin No. 102.

103:
HERE'S ANOTHER one of Westinghouse's unadorned but useful bulletins. This is about completely self-protecting power transformers designed to provide a better standard service through a lower first-cost installation than the equivalent rating in a conventional substation and through provisions for protection and continuity of service. These transformers feature automatic tap changing under load equipment, low voltage switch, thermal protection, lighting protectors and metering. Ask for No. 103.

104:
EXTENSIVELY REVISED is International Nickel Co.'s bulletin, "Engineering Properties of 'K' Monel." New diagrams enable the engineer to make an estimate of tensile properties when the actual hardness and condition are known. Data on the torsional and compression properties of various tempers have been added. A new section on mill products provides the engineer with information on the available forms, tempers and sizes of "K" Monel. Write ELECTRICAL WEST for Bulletin No. 104.

105:
THE SYNCHRO-OPERATOR for automatically paralleling a.c. generators, synchronous condensers, tie lines and frequency changers is described in Allis-Chalmers' latest booklet.

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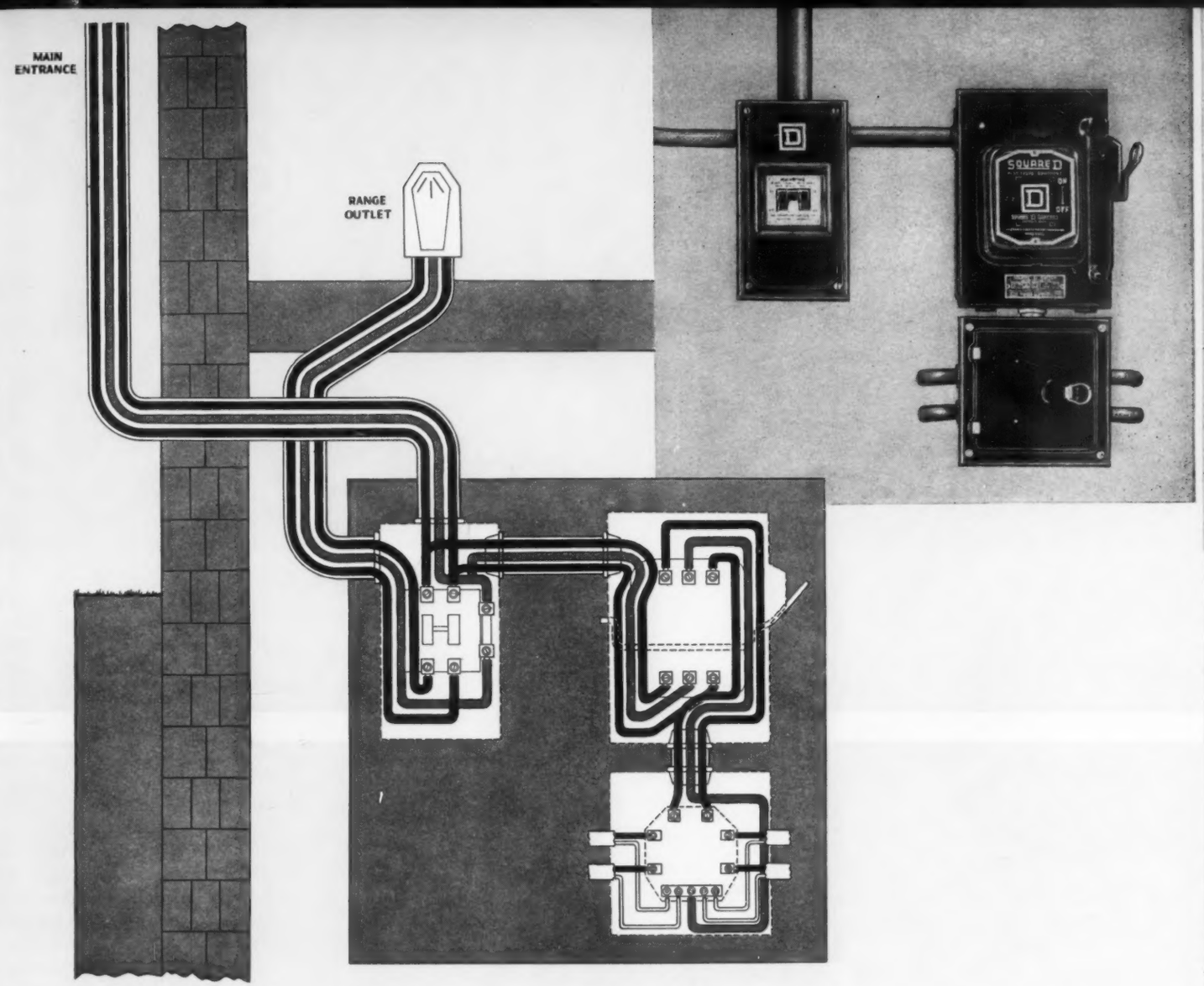


. . IT IS EASY TO ADD
A RANGE OR WATER HEATER CIRCUIT
WITH A SQUARE D MULTI-BREAKER

● When the service entrance switch of a home does not have sufficient capacity for the addition of electric range or water heater, it is easy and economical to add extra circuits by using a Square D Multi-breakeR. The Multi-breakeR is service equipment and may be installed in parallel with existing wiring.

The installation costs less than replacing the service entrance switch with one of larger capacity. The two-pole Square D Multi-breakeR provides circuit breaker protection at an extremely low price.

The 1937 National Electric Code permits up to six service subdivisions or branches, individually controlled with solid mains, when Multi-breakeRs are used.

You'll profit by following up the electric range and water heater campaigns of the Power and Light Companies. Get your share of this business with the Square D Multi-breakeR.

CALL IN A SQUARE D MAN

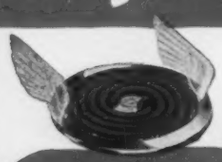
SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

HOTPOINT

NEW RANGES NEW FEATURES NEW PLANS



CALROD TARGETS THE HEAT

CALROD'S HEAT GOES QUICKLY AND ACCURATELY DIRECT TO THE HEART OF YOUR COOKING JOB.

NO HEAT IS WASTED AROUND THE SIDES OF UTENSILS. THERE IS NO FLAME. CALROD HEAT IS CONDUCTED HEAT.

TURN TO ANY OF 5 ACCURATELY CONTROLLED HEATS FROM HIGH SPEED TO LOW-WARM. (SIMMER)

Hotpoint offers the merchandise and sales plans to help you make 1939 a headline year. New range models, priced to win sales from value-wise buyers, will help you cash in on the big popular swing to electric cookery.

In the past 5 years the sales of electric ranges have quadrupled twice. And those "in the know" predict another big year in 1939.

Swing ahead with Hotpoint—the Headline for '39. Get in touch with your Hotpoint distributor today. See the beautiful new range models. Look over the attractive new sales features: 5-Speed Select-A-Heat Calrod. Directional Heat Oven with 5-Heat Switch and Duo-Speed Broiler.

THE SALISBURY—Hotpoint's style and value headliner for 1939. Three 5-Speed Select-A-Heat Calrod units. Directional Heat Oven with 5-Heat switch and Duo-Speed Broiler. Venetia-Lite with Timer Clock and Condiment Set. All Porcelain Enamel, Stain Resistant top

THE METROPOLITAN—A popular-priced winner, 36 inches wide for minimum space requirements. Full cooking capacity. Big oversize oven that roasts and bakes wonderfully. Hotpoint quality throughout. Cabinet base model. Modern styling. Low price to help create store traffic.

1939 Hotpoint

REFRIGERATORS . . . WASHERS AND IRONER

ANNOUNCES

HEADLINERS FOR 1939

THE MARK OF A DEPENDABLE DEALER

Everything to help you sell. Put this sales energy to work getting business and making money for you:

New Models • New Features
National Advertising
Cooperative local newspaper advertising
Window Displays • Store Displays
Cooperative Outdoor Postings
Direct Mail • Outdoor Signs
Store Signs
Retail Sales Training
Retail Salesmen's Equipment
Redmen's Club
Slide Sound Films
Home Service Assistance

Hotpoint's 1939 line of ranges mark the 35th Anniversary of Hotpoint value-leadership. The kind of value that makes your buyers say, "I want that!"

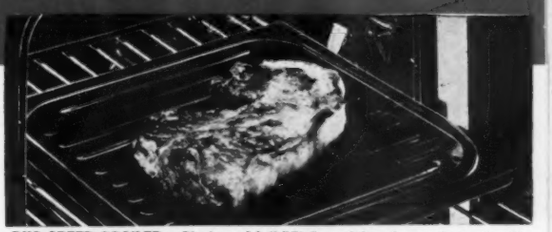
Coming

Another big Modern Kitchen Bureau Electric Range Selling Campaign

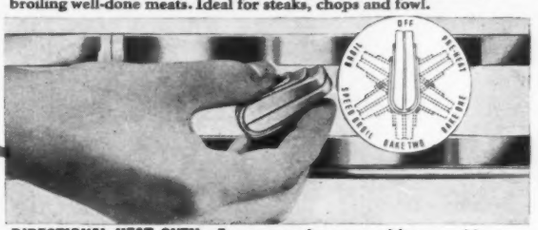
April 1 to June 1

including new, hard-hitting national advertising, magazine and newspaper publicity. New sales promotion plans and materials.

Watch for announcement of M. K. B. "GUESS AGAIN" Campaign



DUO-SPEED BROILER—Choice of full Hi-Speed for charcoal type broiling or lower temperature broiling heat for barbecuing, toasting, and broiling well-done meats. Ideal for steaks, chops and fowl.



DIRECTIONAL HEAT OVEN—Large, oversize oven, with top and bottom heat controlled by one switch. Gives choice of methods. Improves baking and roasting results. A great sales feature.

WHOLE-MEAL THRIFT COOKER—Six quart capacity. Cooks complete dinner at one time. Operates on minimum of electricity.

1 MODERN *Beauty*

...ling style and streamlined ...y provides eye-appeal that ...e enthusiasm of prospects ... you can turn into sales.

2 UNSURPASSED *Speed*

Hotpoint's 5-Speed Select-A-Heat Calrod gives a fast cooking speed that you can demonstrate to convince skeptics.

3 GREATER *Economy*

Select-A-Heat Calrod, Directional Heat Oven and Thrift Cooker all contribute to low operating cost of the range.

4 PROVED *Durability*

Besides Calrod's remarkable durability the entire Hotpoint range is built for trouble-free service and owner reports prove it.

5 AMAZING *Record*

More than 99.99/100% of the millions of Inconel Calrod glass-sealed coils now at work in homes have given unfailing service.

6 Hotpoint

30 years of national advertising and a generation of satisfactory customer service on which to build your business.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5612 West Taylor Street, Chicago, Illinois

Electric Ranges 1939

WATER HEATERS . . . SINKS AND DISHWASHERS

SOLDER AND TAPE ARE OUT OF DATE

USE—

IDEAL WIRE CONNECTORS

Leading electrical manufacturers and contractors have accepted and standardized on IDEAL "Thread-on" Wire Connectors.

They just twist on—make a joint that is **better electrically, stronger mechanically.** IDEAL Connectors press clean threads into the wires, connector and wires being threaded together like a nut on a bolt.

Just screw on, that's all—
No twisting of wires.

Millions in use—because they do a neater job, take up little space in installation and make a joint that is a **real safeguard** against poor connections, shorts and burnouts.

FULLY APPROVED. **Listed by Underwriters' Laboratories, Inc.**

Samples upon request

IDEAL COMMUTATOR DRESSER COMPANY

1042 Park Avenue Sycamore, Illinois

FORGED-IN STRENGTH

BURNDY SERVIT

BURNDY ENGINEERING CO., INC.

● ***REPRESENTED BY:***

Condon & Young, Los Angeles, Cal.
C. E. Ingalls, San Francisco, Cal.
Peterson Co., Denver, Colo.
F. W. Carlson, Seattle, Wash.

It's said that the synchro-operator saves time and money by its speedy action, safety features, compactness, low maintenance cost, etc. And it does away with the usual hazards of manual synchronizing in any type of generating plant. Ask for No. 105 and get the facts.

106:

MORE NEWS about General Electric's Pyranol capacitors is offered in a bulletin on capacitors for low-voltage industrial applications. Described are enclosed capacitor units for indoor service; small rack-type capacitor equipments for indoor and outdoor service (also dust-tight designs), and large rack-type capacitor equipments for indoor and outdoor service. These are rated at 230, 460 and 575 volts. If you want to know more about these units—and this bulletin will tell you everything, including price—write for No. 106 and specify General Electric bulletin GEA-2742.

107:

COMPREHENSIVE LISTING of fixtures for fluorescent lumiline lamps is available in DayBrite Lighting's latest catalog. This catalog supersedes all previously announced information. Units are illustrated, briefly described and priced.

LETTERS

Praise for "Suckers"

DEAR SIRS:

We want to add our praise to the article, December issue, ELECTRICAL WEST, entitled "Consumers Aren't Suckers."

We are convinced that some romance has got to be injected into the adequate wiring campaign, as well as talking the language of the consumer. There is not much romance in a copper wire, an outlet or a brace and bit.

The automobile man built roads and bridges to sell his cars and tires, so why can't the electrical man be guided thereby? It took 20 years to build the San Francisco Bay bridges, yet it is predicted that 1939 will be the best year yet for motor cars. What is the answer?

We wish we knew.

Anyhow, write more articles along this line—print them—keep on keeping on—and good luck.

H. C. BARNARD,
Secretary-Treasurer,
Frank J. Airey Co., Inc.,
Los Angeles.

Heat for Swimming

DEAR SIRS:

In the last issue of ERA, the ELECTRICAL WEST of Sweden, there is an article describing the electric water-heating system of the first open-air swimming pool, 40x120 ft., in Stockholm. There were four fuels available, but coal and coke were ruled out on account of smoke. The cost of the electric-heating plant was considerably higher than using oil, but the complete electric installation—heat, ventilation, cooking (restaurant), lighting, etc.—was only a little higher than a combination of oil and electricity. Automatic control and a slightly lower operating cost determined the final choice.

The water is heated in two 4,000-gal. tanks by 500-volt, three, 60-cycle electrode heaters which can be varied in capacity from 100 to 500 kw., a total maximum of 1,000 kw.

C. H. EDMAN,
Sales Department,
San Joaquin Light & Power Corp.

Sales Guides

DEAR SIRS:

. . . These Sales Guides will be very helpful to us in carrying on our sales training program and we would appreciate receiving your 1938 series as soon as they are available. We would also like to know if Sales Guide reprints are available each month . . .

We are placing our order covering subscription to ELECTRICAL WEST as we think you have a very splendid publication.

ROY H. KNOX,
Supervisor, Sales Promotion & Adv. Dept.,
Birmingham (Ala.) Electric Co.

DEAR SIRS:

In recent issues of your publication, I have read with a great deal of interest the Appliance Sales Guide feature.

I should like from time to time to reproduce certain portions of the Sales Guide in sales promotional bulletins to our own organization or in a monthly publication to associated electrical dealers in this territory. I am appealing to you, therefore, for permission to use the information as stated or for information upon what basis the series of Sales Guides may be obtained and distributed in reprint form by us.

E. N. POPE,
Director, Sales Promotion & Advertising,
Carolina Power & Light Co.,
Raleigh, N. C.

Information? You Bet

DEAR SIRS:

In making a study of interconnections of electric utilities on the Pacific Coast, there is certain information which is not available in this area, so I am taking the liberty of writing you, believing your organization no doubt has this information.

The information we are desirous of obtaining is as follows:

(1) Location (station designation and systems) of interconnections between the electric utilities in northern California, Oregon and Washington.

(2) Capacity and limiting factor of the interconnection, such as transformer, line, frequency changer.

(3) Transmission line voltage on each side of the interconnection.

As an example: "S.C.E.Co.-S.D.C.G.Co., Capistrano. 5,000 kw. Frequency changer. 66 kv.-66 kv."

Any information you may be able to give us on this matter will be sincerely appreciated.

F. L. ELEY,
Engineer, Operating Dept.,
Southern California Edison Co.

Ready early this year will be a map of the transmission systems of eight of the Far Western states which will include these and other pertinent data. The map is being drawn by Frank I. Towle, Jr., of Portland. It will be on a scale of 1 in. to 40 mi. and will measure approximately 28x38 in. It will show all utility systems in this area with transmission lines rated at 22 kv. and above. Inserts on a larger scale will show the metropolitan areas of Seattle, Portland, San Francisco, Los Angeles, etc. Location of steam and hydroelectric generating stations will be indicated together with installed capacities. Similar data will be given for the principal system interconnections. Blue line prints of the map will be available at $20 each.

All eyes are focused on

Frigidaire

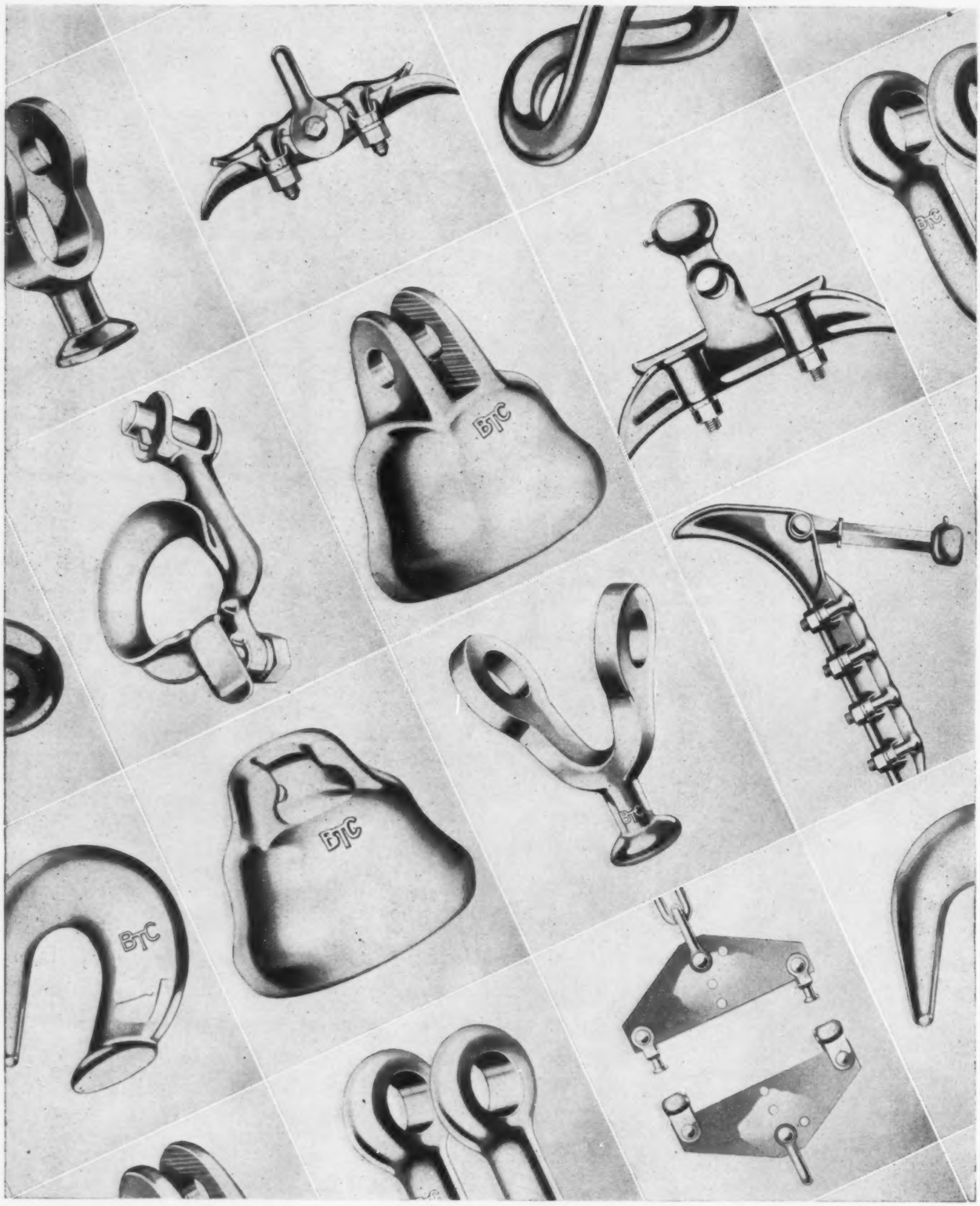
for 1939

THAT big things are happening in the Frigidaire plants is common knowledge. But just what is going on, few know, and none will tell. Rumors are plentiful, facts scarce. Flying trips into the field by Frigidaire officials indicate unprecedented measures to assure organization preparedness.

All that can be learned now is that sensational refrigerator and range announcements will be forthcoming shortly after the first of the year. Meanwhile, a curious nation and a curious industry are waiting . . . certain of only one thing: Frigidaire, manufacturer of the world's fastest-selling refrigerator, has something big up its sleeve for 1939!

FRIGIDAIRE DIVISION, GENERAL MOTORS SALES CORPORATION, DAYTON, OHIO

ELECTRIC REFRIGERATORS · ELECTRIC RANGES · ELECTRIC WATER HEATERS



BTC This Trademark is Good Insurance

Confidence

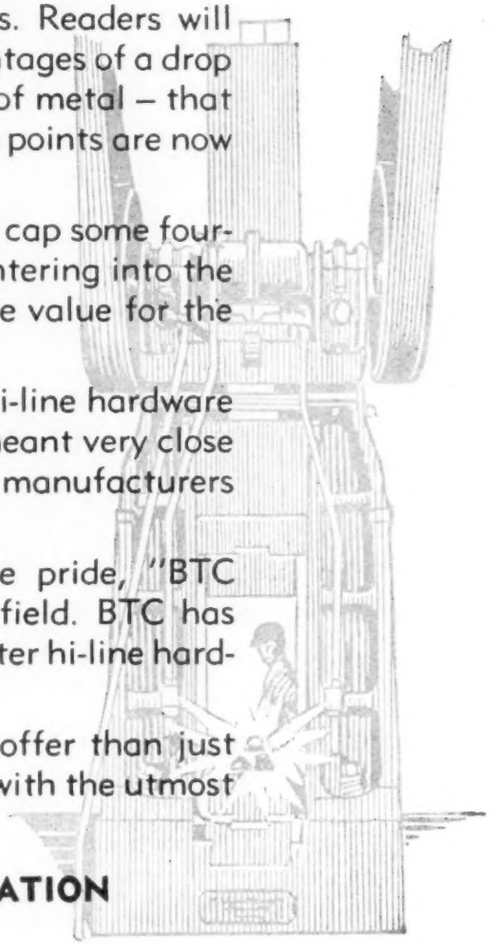
Quite a puddle of water has passed over the dam since BTC inserted its first advertisement in these pages. Readers will recall how we continued to point out the advantages of a drop forging. Strength with lightness – uniformity of metal – that added margin of safety – dependability. Those points are now accepted and proven facts.

But since the conception of the drop forged cap some fourteen years ago, there have been other factors entering into the picture. Factors that we believe have a definite value for the man that writes the specifications.

The development of all this drop forged hi-line hardware that you use and see in the BTC catalog has meant very close contact with utility engineers and insulator manufacturers alike.

We feel that we can say with pardonable pride, "BTC knows and understands the problem of this field. BTC has had a definite hand in the development of better hi-line hardware."

And so we say, we have something more to offer than just hardware. A trade name that can be specified with the utmost confidence.



THE BREWER-TITCHENER CORPORATION
Cortland, New York

Specify BTC Drop Forged Hardware

ELECTRA'S HUSBAND

Resolutions for '39

IT was New Year's morning. Resolutions for 1939 were in order. "Personally," I said, "I have two. I will not quit smoking and I will hang up my bath towel. But what really interests me is a resolution or two for the electrical industry."

"M-m-m-m, that shouldn't be hard," Electra said. "First thing I'd suggest would be for your great industry to learn how to wrap Christmas packages and gifts generally. Remember that traveler's iron I bought for Irma at the Voltamp Electric Co.? It was wrapped in some Santa Claus and bells paper that must have cost at least 3c—for a hundred sheets. The sheet was too large and when the clerk got through with his manipulations it looked as if some vagrant in Union Square had slept on it. For a finishing touch, he tied it with green string. I'm sure he had a clear conscience, for he made no effort to conceal his finger prints. The enclosed package was complete in every way, including price tag. Some day he will complain to you that the department stores are getting all his business."

"That's No. 1," I said. "Anything else?"

"I'm not through with the first one yet. Why don't your power company friends learn how to take orders over the phone? Why does the sales girl keep her spare lipstick in the corn popper I'm about to inspect? Why do they make me sign something, even when I pay cash? Why don't they deliver my purchases instead of making me lug them home? Why don't they—? But why go on? If power companies are going to sell, and expect people, especially women, to buy, why don't they learn some of the little tricks of modern business?

"Now I'm ready for No. 2. A good resolution for the PCEA would be to appoint a committee to investigate gadgets. Gadgets are a big factor in influencing sales."

"But, my dear," I protested. "The electrical industry is practically made up of gadgets."

"You mean jiggers that are inside of something to make it do something else. They're not gadgets. A gadget is something added to something so a woman who wouldn't buy it without will buy it with. Do you see?"

"I must confess it's a trifle vague. Elucidate."

"Remember that tea-kettle Mrs. Munson gave me last Christmas? It had a bird on the spout and it would whistle when the steam came. That was a gadget. She never in the world would have given me an ordinary kettle for Christmas. But I like the cute little thing."

"I rather admired it myself," I admitted.

"And then there was Nancy. I went with her to select an electric range and she was all ready to buy—until the clerk showed her a gas range which had a gadget that would keep the oven shelves from sliding out on the floor. So she bought the gas range."

"But, Electra, nobody is going to pull the oven shelves so far that they will spill on the floor!"

"I KNOW it, and I told Nancy, but it was a gadget and she wanted it. So there's something for the PCEA to investigate. All sorts of concerns depend on gadgets to get business. Who cares how many cylinders there are in an automobile these days? What we look at is the ashtrays. The greatest gadget in the world is the zipper. Why don't your electrical friends use some of them?"

"How could they?"

"That's for the committee to discover. You know how attachment plugs come apart at the wrong time. You might fix that with a zipper. Another idea would be to have a convenience outlet for electric shavers in the bathroom, with a slot where you could dispose of old razor blades."

"That's screwy. If a fellow has an electric he doesn't need blades."

"I know it. But that's the way with gadgets—they're merely sales points—you don't have to use them. And speaking of convenience outlets, there's a chance for resolution No. 3. Why not put them where they'd really be convenient?"

"But we do," I said. "You know that."

"But you don't. Did you ever try to disconnect that bedside lamp of mine? You couldn't, because you're too fat. It's exactly under the middle of the bed. I'd wear a mustard plaster before I'd try to connect my warming pad to that thing. And why do the electrical experts put all the outlets in the baseboard? Most of them should be waist high so that the iron, the vacuum and other devices could be connected without bending over so far I pop my stockings. There's a lot to be done before anybody can brag about electrical convenience.

"Here's another thought. Why doesn't someone contrive a way to put broad feet on ranges and refrigerators and washing machines so they won't cut the linoleum? And here's one for the lamp companies. They ask us to buy lamps by the carton. Most of the cartons are about the same size and you can't tell what lamp you want without dumping the whole collection on the floor."

"SEEMS to me each package is stamped some place," I said.

"Maybe it is—some place—but I can never find it when I want to know. I'd print 60 WATTS so big you could read it with a flashlight, or a candle, which is what you have to do sometimes. That's not a gadget, but it's an idea. No charge. Some day a man with real brains will invent something like a necktie holder with a long row of sockets to hold extra lamps—something that would fasten inside a cupboard door. Then your spares would be handy and you could always tell what sizes were missing. But when you get it, don't sell it—give it away with an order for two cartons—or make it a premium to go with a curling iron. Anything to convince the female customer that it's a bargain.

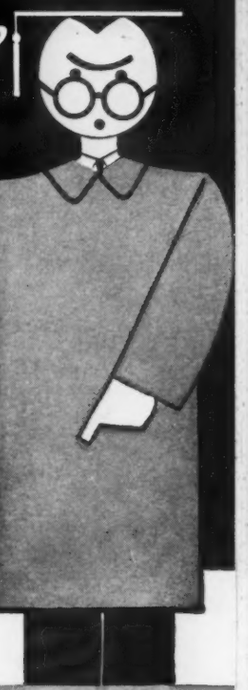
"The trouble with the electrical business is that it sells things designed by men. If I were a sales manager, I'd take my wife and daughter and my elderly aunt and the pleasant lady who lives next door and go shopping. Don't ask what for. Sometimes women go buying but generally they just go shopping. I'd find out what they look at, and the questions they ask, and I'd observe what they expect in the way of service, and then I'd go back to my store and think—and think—and think."

"And then . . . . . ."

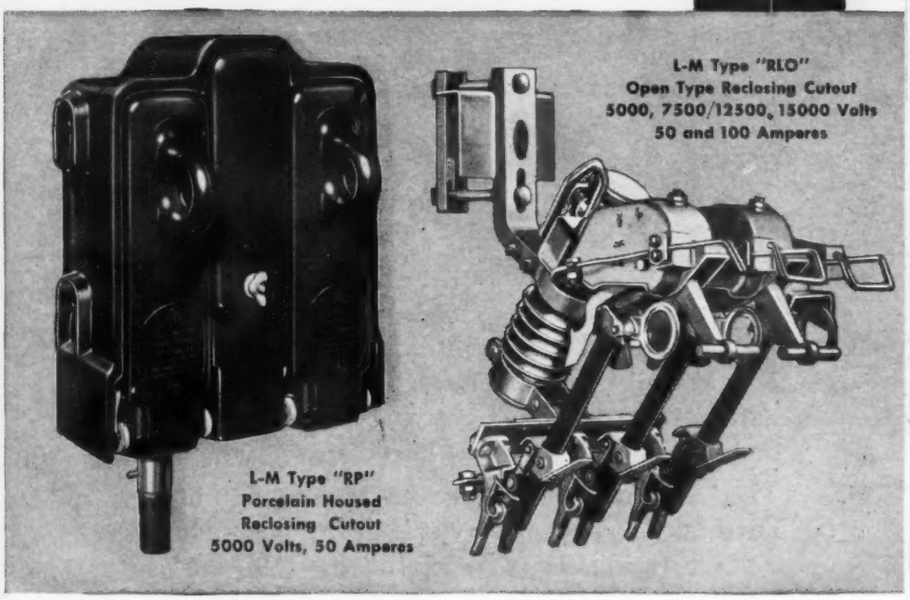
"And then I'd get together some modern, practical ideas and take them upstairs to the boss and he'd say, 'You're crazy. What do women know about the electrical business?' "

"How to win friends and influence people"..

TO BUY MORE KW-HRS.



Sectionalizing with L-M Reclosing Fuse Cutouts *insures* service continuity that wins friends, builds load, and increases your profit per kilowatt hour. Designed specifically to meet today's conditions, L-M Reclosers are preventing many a needless outage on busy lines, protecting customer good will as well as equipment . . . and at lower cost. Specify L-M, get the *only* Reclosing Cutouts of fully automatic operation.



L-M RECLOSING CUTOUTS
Give you these features

FULLY AUTOMATIC OPERATION . . . . nothing to "cock", nothing the lineman must remember to do, and impossibility of two fuses being in parallel.

BELLOWS TIME DELAY . . . . . insuring a time lapse between opening and reclosing the circuit, preventing needless blowing of the second fuse.

FIRM, SURE CONTACTS . . . . . the fuse cartridges cannot drop out of position due to vibration.

PLAIN INDICATION . . . . . one glance tells where refusing is needed. L-M Reclosing Cutouts have only "Up" position and "Dropout" position, no confusing third or "intermediate" position.

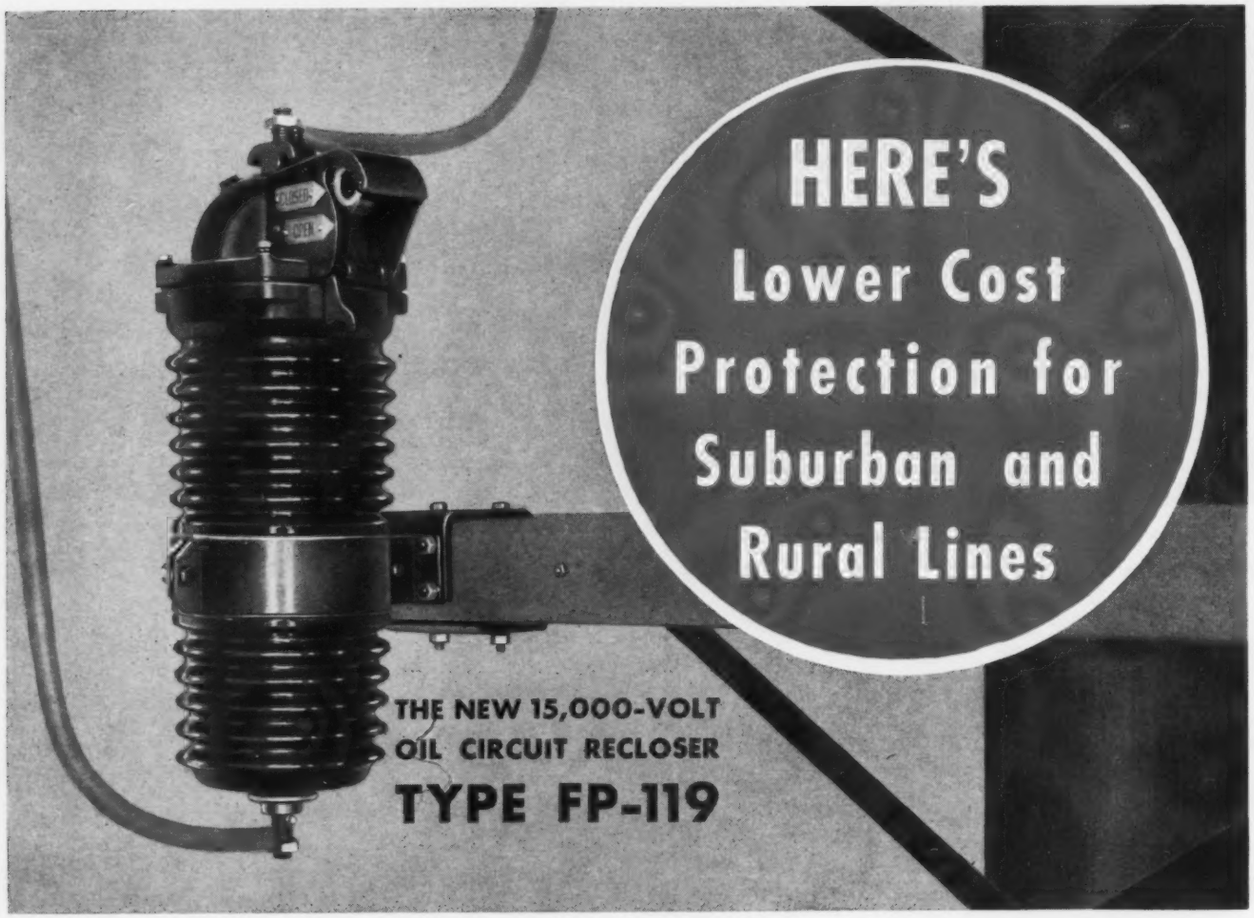
• • •

Consult your L-M representative on all your fuse problems. Line Material Company western offices at

PORTLAND SPOKANE SEATTLE OAKLAND
LOS ANGELES PHOENIX DENVER

LM

LINE MATERIAL CO.



FOUR years ago we introduced the FP-19—the first oil circuit recloser. It provided low cost automatic reclosing on outlying lines of 7500 volts and below.

The industry liked it—proved its dependability by putting thousands in service—asked us for a higher voltage rating. Here it is, the FP-119, good for circuits 15 kv and below.

Automatic reclosing eliminates 75 to 90 per cent of outages because most faults on overhead lines clear themselves as soon as power is removed. Reclosing restores power, keeping customers satisfied and making them willing to buy additional load-building devices.

Install FP-119 oil circuit reclosers on your outlying lines for better service in emergencies—less maintenance in the long run. General Electric Company, Schenectady, N. Y.

About the Recloser Itself

Operates three times if necessary—then locks out on a permanent fault. Resets for another operating cycle if fault is cleared before lockout.

Takes care of itself—requires no attention except occasional inspection of oil and contacts.

Easy to install—is mounted on a pair of crossarms on the pole.

Three seconds' time delay between reclosures—ample time for most faults to clear up.

Reliable, enclosed mechanism—protected from dust, rain, and snow.

One-piece porcelain housing—maximum insulation—reliable operation under all weather conditions.

Equipped with oil gage, operation counter, and drain plug.

Four ratings—6, 12, 25, and 50 amperes—ratings easily changed in the field.

Oil-blast action for dependable, fast circuit interruption and long contact life.

GENERAL ELECTRIC

890-76

BUILDING PRIDE TO DEVELOP GOODWILL

By A. E. Hitchener

THIS appears to be an age of phrases. People speak of Socialism, Fascism and Communism, for example, yet probably only a few know the fundamental difference between them. It is also extremely doubtful if many know the difference between a Communist and a Bolshevist, yet these have become common-place epithets.

Another phrase that rolls glibly off the modern American tongue is "public relations." Beautiful brochures are published to build up "public relations"; testimonial dinners and plant visits are held to capture or maintain good "public relations"; films are produced and radio broadcasts sponsored in the name of "public relations." And what is this ephemeral thing that industry must strain so ceaselessly to gain and preserve?

In the first place, it is difficult to define "public relations," because it is basically emotional, like love, fear or hatred. It can only be defined as the predominant sentiment with which our customers regard our company and its products or services. If that sentiment is favorable, our public relations are said to be good; if unfavorable, they are poor.

INASMUCH as most of the contacts which our customers have with our company are not with our executives and department heads, but with our salesmen, counter people, telephone operators, servicemen or delivery people our public relations are founded very largely upon the impression these employees make upon our customers. Obviously, then, there cannot be good public relations unless there are good employee relations; the two are inseparable. We cannot hope to build a friendly public attitude except upon a firm foundation of favorable employee relations. Without a spirit of loyalty among the employees, without a feeling of company and industry pride that extends from the president to the newest office boy, good public relations cannot be bought at any price. Contrariwise, build this pride and loyalty in our organizations and our public relations will just about take care of themselves.

What, then, are some of the elements essential to building these all-important employee relations in our organizations? Primarily they are, of course, the conditions within the company itself; but secondarily, and of much greater importance than generally supposed, they are the position which the company occupies in its industry, and the position the industry occupies in the general social order. Reduced to the simplest terms, therefore, we may say that the soundest public relations are those which are established, not by an extensive advertising campaign telling the public how good we are, but by a staff of employees who are sincerely sure they are working for the best boss in the greatest company in the finest industry.

THIS being the case, it is inexcusable that there should be any public relations problem within the electrical industry.

The question of company policies and employee relations within each individual company are matters which must be handled individually by each company for itself. However, there are certain fundamentals which apply to all companies. One is the recognition that under the new order which seems to have permeated our economy, business lives in a glass house. Every business that touches the public is now a public business. And that applies forcibly to every unit in the electrical industry. Every policy or every act of commission or omission becomes a matter of public knowledge and, as such, a factor in the creation of a friendly or unfriendly attitude. In shaping the internal relationships and propounding policies, our executives are faced with a job they cannot delegate or buy.

It is a matter of common knowledge that people will recognize mistakes, slights or sore spots quicker than they will achievements. Let us not make any more mistakes, or permit any slights or create any sore spots. Those are responsibilities which our managements are capable of handling. They are essential to our program of building friendships. The companies in our industry have the brains, the leadership, the man power and the knowledge to create employee relations and sound policies that will engender the regard and loyalty of the rank and file.

THE position of our industry in the social order merits public respect that should build for us a favorable public sentiment. It is the most vitally important industry in all aspects of human life. It not only contributes to but has become almost indispensable in every field of human endeavor. Industry, science, transportation, recreation, health, communication—all owe their achievements to the application of electricity to their problems. There should be no question, then, as to the right of everyone in the electrical industry to feel a strong industry pride. Give them employment in a company whose policies and practices entitle it to the respect and regard of the rest of the industry, and let them know that their work is a real contribution to that progress of which we are all so justly proud, and we are well on the way to a solution of our public relations problem.

This maintenance of industry pride, however, involves constant dissemination of information regarding the industry's new developments and accomplishments. Such a program can best be conducted by an industry-wide cooperative group such as the Industry Information Committee of the PCEA. Plans now are being developed by this committee to make available to every one in the industry sufficient factual data to "sell" them thoroughly and keep them sold on the part which their industry plays in modern society. Let us not waste the efforts of this committee. Let us carefully analyze conditions within our companies to see if there are not some things which can be done to improve our employee relations—to generate an even greater company pride than we have today. Let us constantly keep in mind that all things are relative, and adopt as our formula:

Company Pride+Industry Pride=Good Public Relations.

	LAMPS	WIRED HOMES	AUTOMOBILES	HOMES WITH RADIOS	ELECTRIC CLEANERS	REFRIGERATORS	ELECTRIC RANGES	KILOWATT-HOURS	MOTORS IN FACTORIES
1878	NONE SOLD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
1888	A FEW THOUSAND SOLD	A FEW	NONE	NONE	NONE	NONE	NONE	LESS THAN A BILLION	VERY FEW
1898	MORE THOUSANDS SOLD	MORE	MAYBE 3000	NONE	NONE	NONE	NONE	2 BILLION	SOME
1908	PERHAPS A MILLION SOLD	1½ MILLION	⅕ MILLION	NONE	A FEW	NONE	NONE	6 BILLION	4 MILLION HORSEPOWER
1918	MANY MILLION SOLD	7 MILLION	5½ MILLION	NONE	⅜ MILLION	NONE	3000	25 BILLION	15 MILLION HORSEPOWER
1928	634 MILLION SOLD	19 MILLION	21 MILLION	7½ MILLION	9 MILLION	1¼ MILLION	¼ MILLION	63 BILLION	32 MILLION HORSEPOWER
1938	955 MILLION SOLD IN 1937	23 MILLION	25½ MILLION	26½ MILLION	11 MILLION	11¼ MILLION	2 MILLION	100 BILLION	41 MILLION HORSEPOWER

This Job of Friend-Making

WHILE some people in the electrical industry may appreciate the substantial contribution of electricity to modern standards of living, it is a certainty that Mr. and Mrs. Average Citizen have little realization of how life today is freer, happier and more comfortable because of the widespread availability and utilization of electric service. Not only can the rank and file of the industry feel a distinct pride in the accomplishments of the industry since its birth, but they have an obligation in interpreting and evaluating these things to the public so that they may be better understood. Such a story will accomplish a dual purpose—it will build favorable public sentiment and at the same time smooth the way for a stronger selling story.

The two accompanying charts illustrate graphically the changes which have come about in industry and in living since the introduction of electric service 60 years ago. They are taken from a recent issue of the "G-E Monogram." The first (see right) shows the effect of the mechanization of industry through the application of electric power. More efficient methods, processes and machines have brought the cost of what formerly were luxuries down within reach of almost every citizen. Factory horsepower increased 14 times in the 60 years since 1878. Over 80% of this was in electric motors. In the same period, jobs in factories increased three times and total factory wages 11 times. The value of the goods produced jumped elevenfold, yet during this time the total population fell short of a threefold increase. Electric power was one of the vital factors in creating the economy of more goods for more people at lower and lower prices.

Equally important has been the

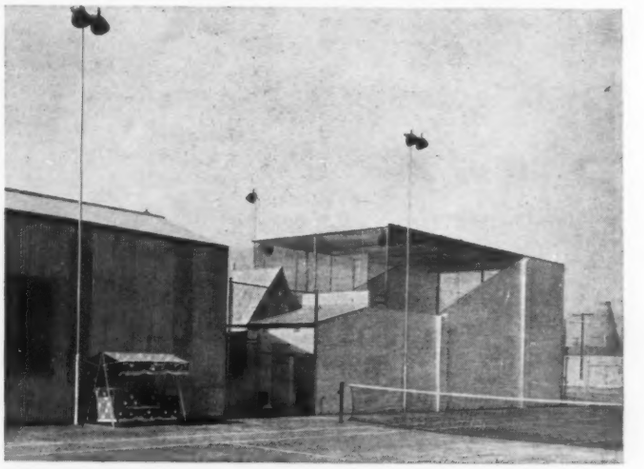
	1878	1937
Horsepower installed in factories—a measure of the use of machines	$	INCREASED 14 TIMES
Jobs in factories		INCREASED 3 TIMES
Total factory wages		INCREASED 11 TIMES
Value of goods produced in factories	$	$$$$$$$$$$$ INCREASED 11 TIMES
Production per person (USA)		INCREASED 4 TIMES
Population		INCREASED 26 TIMES
Use of electricity	NONE	100 BILLION KILOWATT-HOURS ANNUALLY

What electricity has done to raise the standard of living in America may be gained from a study of this chart from the "G-E Monogram"

Opposite page: With the application of electricity to manufacturing processes, production, wages and jobs have increased tremendously

greater and greater use of electricity in American homes. The second chart shows the last 60-years' progress in making the home a more healthful, a better and a more enjoyable place to live in and at the same time in emancipating the American housewife by means of time- and toil-saving devices.

At the same time it reveals some of the opportunities which exist if the industry's story can be told more convincingly to more and more people. Only on radio has the industry accomplished a job comparable to the automobile people. One advertising expert recently said that more electrical appliances and services need to be transferred from the "I'd like to have" pigeon-hole in the customer's mind to the "I must buy" pigeon-hole. To accomplish this, every member of the industry has a personal responsibility to tell the industry's story to the public at every opportunity.



Where employees do exacting work, relaxation is a necessity. Wise managements, like that of Lane-Wells Co., Los Angeles firm specializing in precision machines for oil-well exploration, meet this problem by providing playground facilities. Well-lighted tennis and handball courts similar to these installed for Lane-Wells by Quality Electric Co., Los Angeles, prove a good investment because they invariably stimulate employee good will

ELECTRICITY IS CHEAP!

.....:

YOUR AVERAGE COST WAS ONLY.....c PER KILOWATT HOUR for the period between.....and.....

Your bill shows the following items:

General . . . .KWH, $.....
Water Heater (unmetered) . . . .KWH, $.....
1000 watt heater figured at 648 KWH per mo.
750 watt heater figured at 486 KWH per mo.
600 watt heater figured at 389 KWH per mo.
Water Heater (off peak) . . . .KWH, $.....
Other metered uses . . . .KWH, $.....
Total . . . .KWH, $.....

BE YOUR OWN RATE REDUCER! The more electricity you use the cheaper it gets. Look on the back of your bill to see what electricity does for you at such a low rate.

HOW vital it is to have people of understanding and tact at the point of public contact is becoming recognized. Such persons are best suited to the job if they have a naturally happy personality and are permitted the time to build friendships while making their contacts.

One of the best examples is to be found in Reno in the person of Elmer Boyne, the combined meter reader and service man of Sierra Pacific Power Co. Elmer is known to every customer in the city, chiefly because he is friendly and helpful and takes time to see that his customers are all happy. He may not break any records in the number of meters he can read in an hour or a day, nor at any given distance. In fact he is under no compulsion of speed at all. It is recognized by his company that he is of far more value as a patient, considerate, friendly ambassador than as a high-speed meter reader.

For example, Elmer usually anticipates a complaint rather than waiting for it to happen; and by anticipating it, can eliminate its cause before some one loses his temper. When he reads the meter he notices if the consumption has gone up more than the season would warrant. So he stops long enough to talk with the customer.

"Well, I see you must have had company last month, Mrs. Jones," he remarks, "you used a little more electricity than usual. Hope you enjoyed their stay and all had a nice time."

In other words, he talks until he gets the reason for the extra use of electricity that month, and thus recalls it to the customer's mind. When the bill comes there is much less likelihood that the customer will have forgotten the cause, and a complaint is not apt to be registered.

In its dealer policy, Sierra Pacific does no merchandising at all, but it does virtually all of the servicing of the customers' electrical equipment. It insists on doing this in order to have the opportunity to serve the customer in a vital way and to establish a personal relationship between customer and company—in this case the contact employee. Dealers, after thinking over what a lot of grief servicing is, decided they prefer to do all the selling of new appliances and are glad to be relieved of most of their service costs.

A SIMPLE form which is either given to them when they pay their bills or sent to them in the mail periodically impresses Puget Sound Power & Light customers with the low cost of electricity.

Cashiers do the job. They either fill out the forms (see left) in advance and have them ready when a customer appears or they compute them from the bill itself. In either case, the procedure is thoroughly explained in a corner of the form (not shown).

In instances where payment is made by check, a letter, of which the following is typical, is mailed with the form.

"Dear Mr. or Mrs.——

It is the practice of the Puget Sound Power and Light Company to explain the electric rates to our customers and enlighten them in any way possible about their electric light bill.

In your case, paying by mail, we are unable to do this personally, so we are taking this opportunity to show, by the enclosed slip, how cheap your electricity really is. It will show you what your average cost per K.W.H. was for one month for all the electricity you use.

We want you to feel free at all times to inquire about anything that might trouble you regarding your light bill.

Yours very truly,"

Among the low average rates called to the attention of specific customers was one case where the monthly average was 0.78c per kw.-hr.

This system has been found effective in spreading the story that "electricity is cheap" in Puget Power territory.

Power For Bay Bridge Trains

A WEIGHTY opinion on the Bay Bridge railway electrification will be given out this month by some 50,000 ex-officio consulting engineers. They are the 50,000 San Francisco-Oakland commuters who will take their first ride across San Francisco Bay by railway, thus saving themselves about 15 min. each way apiece.

Doubtless each commuter will take that first ride alert to every change in train speed, knowing that an automatic signalling system is telling the motorman how fast he can go and constantly threatening to stop his train for him should he fail to toe the mark. At the end of the first ride, many a commuter will hold a profound consultation with his watch and wonder, perhaps, how he is going to spend the 130 odd hours that the new mode of travel will save him in a year.

But in all this mass of criticism and speculation it is a sure bet that only slight attention will be given to what, after all, has been the big electrical job: that of delivering power in such form and at such place and time that these 50,000 commuters can be taken from their homes to work and back again with comfort, safety and speed.

That job is the one which for months has been engaging the skill of engineers for the Pacific Gas and Electric Co., the Key System, the Interurban Electric Railway, Sacramento Northern and the Bay Bridge. It began in 1934. An act of Congress led to the Reconstruction Finance Corporation's earmarking $16,000,000 for carrying the two lines (then operating in Alameda County) across the bridge.

Fundamentally, the problem was to transport 50,000,000 persons annually across San Francisco Bay. Present traffic is about 30,000,000. The first figure was established by a study, conducted by the Hoover-Young Commission in 1930.

Available for such a task were the suburban-type trains belonging to the Key and Interurban systems which were providing transportation from the centers of Metropolitan Oakland to their respective ferries. These two systems operated at different voltages both d.c.

The Bay Bridge (Fig. 1), including approaches, is 8¼ mi. long. It has two decks. On the lower one, beside a 3-lane highway for commercial vehicles, space was reserved for two railway tracks. These are not level.

At the east end (Fig. 2), the tracks traverse a long mole (Key Mole), pass through storage yards and switches toward their various mainland destinations. On the West end, a 6-track system loops through the San Francisco terminal building above street level.

It was over this route, with consideration for existing equipment, that the railroad men proposed to carry out their assignment. They figured train make-ups (called "train consists"), train schedules and train speeds. When these were established, the load could be determined, and electrical facilities could be chosen to serve this load.

Actually, of course, the procedure was not so cut-and-dried as that. The eventual design grew out of the coordinated contributions of all parties concerned.

Such conferences yielded these decisions: to adapt existing railway equipment for operation on the bridge; to provide dual-voltage service (by catenary and by third rail) for each track. and to serve these loads by rectified current from the P.G.&E.

Because distance in which a train can stop determines the minimum headway between trains, and because stopping

ENGINEERING

distance varies roughly with the square of speed, railroad men found they could get more passengers across the bridge by running their trains slower than the maximum 40 mi. per hr. allowed them by the bridge engineers. At 35 mi. per hr., the chosen speed, trains can run with 63.5-sec. headway, but 75 sec. suffices for present needs. This enables the trains to evacuate 9,000 passengers from the San Francisco terminal during the 20-min. peak which begins at 5 p.m.

Maximum Key trains (625-volt), consisting of seven articulated units, are 773 ft. long. Loaded with 868 passengers, they weigh 541 tons. Motor horsepower is 3,080.

Maximum Interurban trains (1,300-volt), consisting of six motor-cars and four trailers, are 724 ft. long. Loaded with 1,160 passengers, they weigh 571 tons. Motor horsepower is 3,360.

These, then, constitute the load. They are expected to produce the following half-hour peak demands:

Interurban (1,300-volt): 4,250-kw. on the San Francisco side, 3,100 kw. at Oakland; Key (625-volt): 3,300 kw. at San Francisco, 3,080 kw. at the Island, and 2,080 at Oakland.

P. G. & E. will deliver this energy on a schedule which probably will be based on demand, that is, kw., not kw.-hr.

A picture of the physical arrangement can be obtained from Fig. 3. This is not to scale but does show relative positions. The tracks represent electrical one-line diagrams for the two contact systems: 625-volt third rail for the Key, 1,300-volt catenary for the Interurban. Actually, both contact systems are carried on both tracks, so that both kinds of trains can operate east-bound over one track, west-bound over the other.

Adjacent to the tracks are the three substations which, fed 3-phase at 12-kv., deliver the appropriate d.c. voltages to the tracks. The Interurban is fed at the east and west ends (Sterling and Mole substations). The Key, operating at the lower voltage, would have needed excessive feeder copper to maintain voltage had it been fed only from these points. Hence, it is also fed from Island substation, near the center of the bridge length.

How P. G. & E. got service to these points is indicated in Fig. 3. From its Station C in Oakland, where steam energy is generated and hydro energy received, three feeders were run to Mole substation. These energize a 12-kv. bus, which is tied to a second 12-kv. bus in Station P (not shown; it is a switching station adjacent to Mole substation). From Station P are submarine cables to Treasure Island. Two submarine cables (one old, one new) to San Francisco by way of Army Point sub on Goat I. serve Island substation by way of ties between the two subs. Likewise, the existing submarine cables from Station C to Station W in San Francisco were looped through Sterling substation. In addition, Sterling can be served through a tie to Station A, a steam generating plant in San Francisco.

So much for the general nature of the job. The bridge people's estimate of $18,000,000 as the completed cost of the railways is an indication of its size. This figure does not include the substations, which are estimated to cost around $1,500,000. It does include about $5,000,000 for altering the railways' equipment for operating on the bridge, some $3,200,00 to build the San Francisco terminal, $1,368,402 for signalling equipment, and around seven million for purchase of land, supervision and administration, financing, etc.

The function of

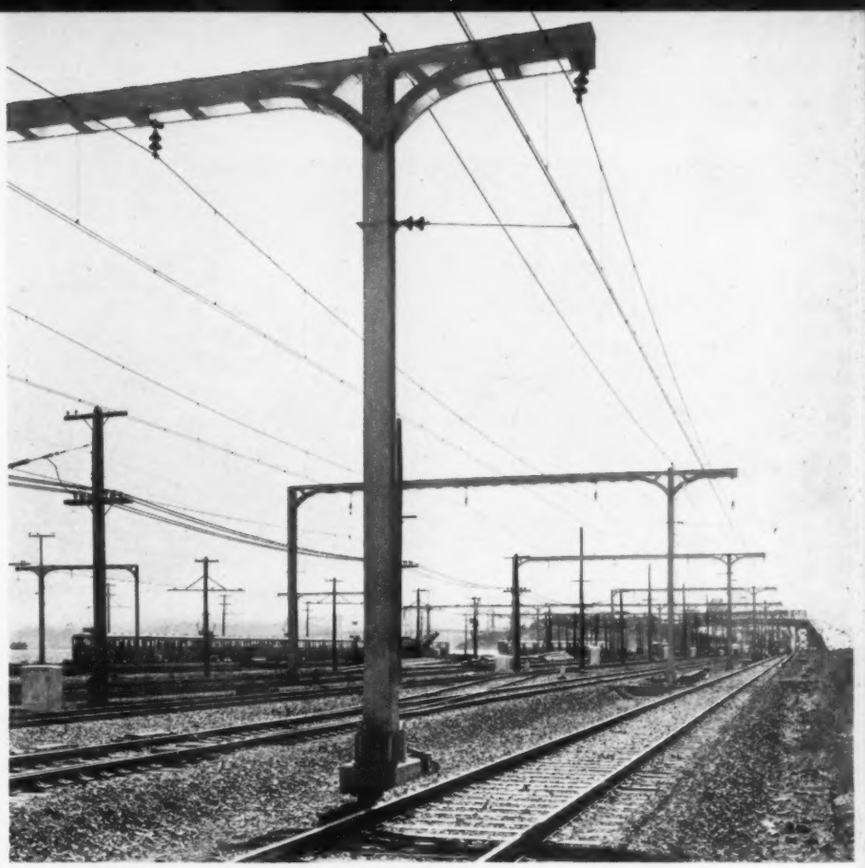
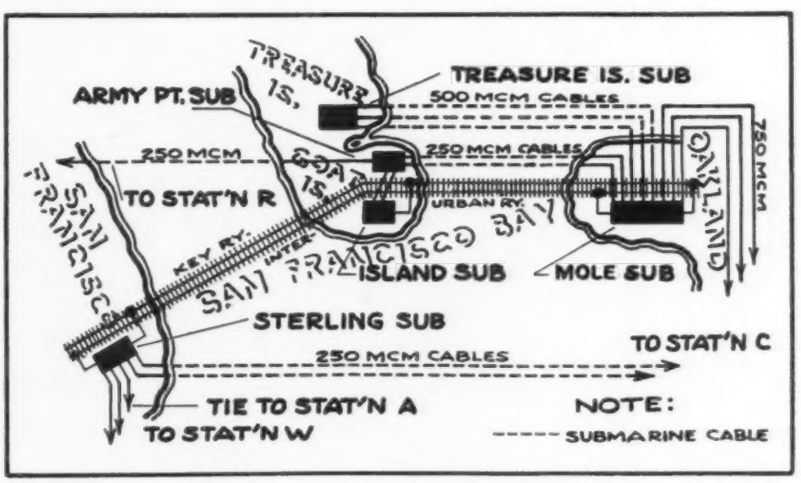


Fig. 1—(Opposite page) Looking east, San Francisco terminal in foreground. Sterling sub is the white building with three vents where tracks and bridge highway form V

Fig. 2—(Above) Oakland mole, looking toward bridge. New Key System articulate trains appear at left. Highway ramp onto bridge in distance at extreme right

Fig. 3—(Below) Relative positions of 12-kv. feeders, substations and tracks



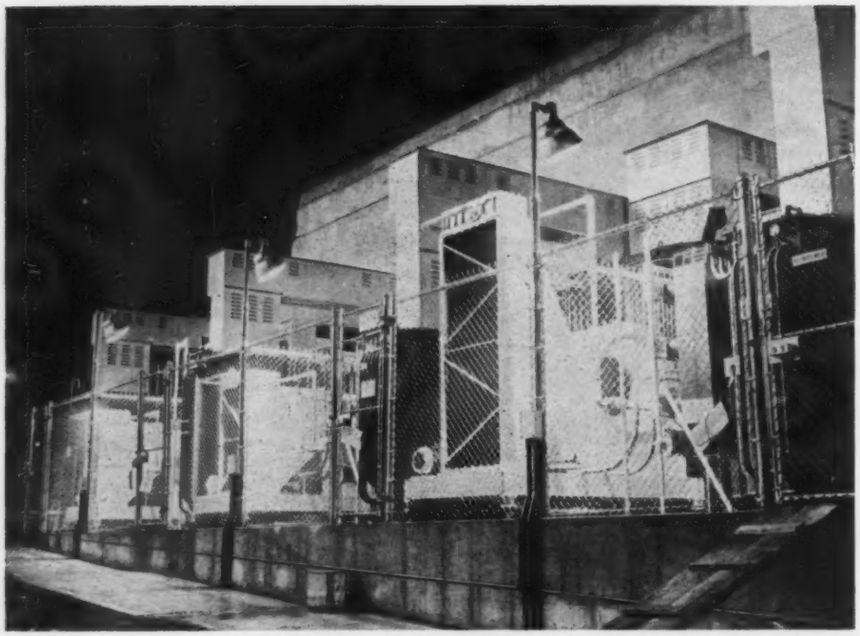


Fig. 4—Main and interphase transformers and rectifier surface coolers set just outside Sterling sub, viewed here from the side opposite that where tracks run

the three substations serving the bridge railways is, fundamentally, to take 12-kv. 3-phase power and turn it out at the appropriate voltage, d.c. The duty or load on each substation being somewhat different, the nature of equipment differs, but essentially it is the same in each. Power is taken through breakers on to a sectionalized a.c. bus. It is fed through breakers to main transformers, to the rectifiers. Positive direct current is taken from the rectifier through a d.c. breaker to the d.c. bus of appropriate voltage. From there, through breakers, it is fed to the catenary or third rail.

As an example of the arrangement within a substation, Sterling substation will be used. A general view appears in Fig. 5. As viewed here, the tracks are to the right. At the right of the picture are the switchboards. The a.c. board is at the far end, the 1,300-volt d.c. board next, the 625-volt d.c. board in the foreground.

At the left wall inside are the four rectifiers, two at each voltage, in the same relative positions as the d.c. boards. Each rectifier is associated with its own main and interphase transformers, these, together with rectifier cooling equipment, being located outside the substation wall (Fig. 4).

With minor exceptions, General Electric Co. furnished the transformers and rectifiers, Westinghouse the switchgear.

On the a.c. side (Fig. 9), Sterling, like the other substations, boasts no abnormal departures from standard practice. It does, however, stand as an example of modern treatment and equipment.

The 12-kv. feeders enter underground. To save space, the usual type of disconnect was abandoned for a 12-kv. isolator. This, a product of Electrical Engineers Equipment Co., is a 3-phase tubular disconnect, enclosed in porcelain.

The breakers are metal-enclosed, lift-up type, 500,000-kva. rupturing capacity, with the switchboard furnished as an integral part of the switchgear enclosure. The single a.c. bus (Fig. 9) is in two sections, each connected to a single feeder and connected by a bus tie breaker. The third feeder can be connected to either side.

Service from the a.c. board to the main transformers is carried in conduit. It consists of paper-insulated, lead-covered, 500,000-circ.mil, 15-kv. cable, wiped directly to the pothead on the transformer, leaving no parts exposed.

This is the point at which conversion from a.c. to d.c. begins, the purpose of the main transformer being to supply 12-phase voltage to its associated rectifier. The rectifier carries 12 anodes and consists chiefly of a steel-tank vacuum chamber; main, starting and excitation anodes; mercury cathode, and vacuum pumping system.

Reference to Fig. 8 may help in visualizing the rectifier's operation. The

Fig. 5—Sterling sub: the four 2,500-kw. rectifiers are along the wall at left. At right is the switchgear: a.c. at the far end, 1,300-volt d.c. in center, then 625-volt d.c.

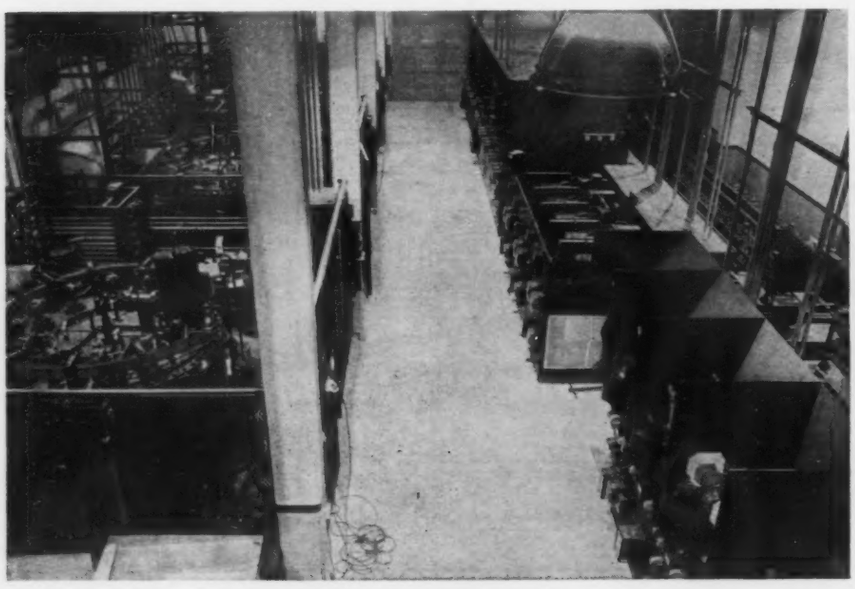
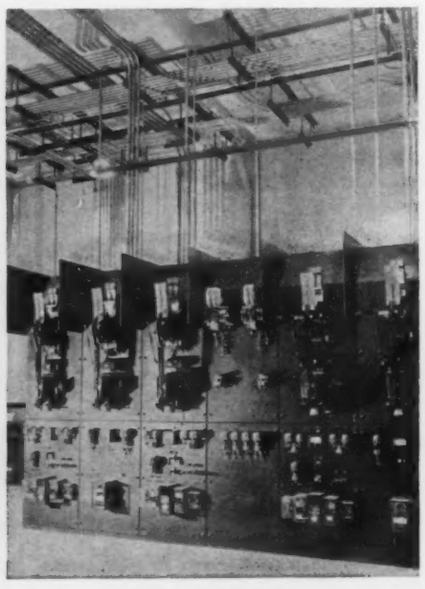


Fig. 6—625-volt switchgear at Sterling sub. Note the neat conduit work overhead



primary of the main transformer is wound delta. Each leg of the secondary carries eight windings, four long and four short, 24 secondary windings in all. These are connected in the combinations shown in Fig. 8, one short and one long winding in series constituting one leg of a Y, four Y's in all, yielding 12 legs with voltages displaced by 30 deg. Each of these is connected to a rectifier anode.

Were the neutral points tied directly together to form the negative return, each anode would fire for 30 deg. (neglecting inductive overlap inherent in the system), the next anode taking over as its voltage rose above that of the one firing. This would mean that each secondary winding, for 1/12th of the cycle (likewise each anode), would be called upon to carry the full load.

Function of Interphase

By means of the interphase transformers, the firing of the anodes is caused to overlap. For example, consider the instant that No. 1 leg has reached the peak of its voltage wave. As its voltage starts decreasing, those windings of the interphase transformers which form a part of the circuit tend to resist the change in current by supplying a counter voltage. Similarly, they are tending to oppose the increase of voltage in leg No. 2, which is lagging No. 1 by 30 deg. This action continues until the voltage of No. 5 leg exceeds that of No. 1. There being no interphase windings in the circuit between legs 5 and 1 (both being on the same Y) No. 5 anode starts firing when its voltage exceeds that of No. 1. Thus four anodes are firing at any given time, each of the 12 through its own 120 deg. Thus each anode and secondary winding carries but ¼ as much current, but for four times as long. This results in decreased duty and a more economical design.

At Sterling, the two rectifiers furnishing energy to the Key are rated 2,000 kw., 625 volts. The main transformer associated with each of these is rated: 2,260 kva., 3 phase, 60 cycle, self-cooled, 12,300 volts delta/595 volts line to neutral, quadruple zig-zag. The three interphase transformers associated with each rectifier are enclosed in a single tank. Two are rated single phase, 180 cycles, 308 kva., 384/192 volts; and the third is rated single phase, 360 cycles, 224 kva., 140/70 volts.

The 1,300-volt rectifiers are rated 2,500 kw., their transformers 2,780 kva., with 1,220 volts line to neutral on the secondary. The 180-cycle interphase are 370 kva., 770/385 volts, and the 360-cycle, 266 kva., 276/138 volts.

All four rectifiers can carry considerable overload. They will carry:

Full load	continuous
150% load	2 hr.
200% load	30 min.
300% load	5 min.
500-600% load	momentarily

These abilities to carry overload, plus their efficient performance when partially loaded, were among the important reasons for their selection over rotating machines.

Continuous, automatic voltage regulation is accomplished by means of grid control. This yields flat voltage to 150% of load and an approximate 5% regulation slope beyond.

One of the 2,500-kw. rectifiers appears in Fig. 7, the buswork by means of which the anodes are connected to the transformer appearing at the top. Outside the station, this buswork is housed in metal. Each rectifier is cooled by a closed water system from which heat is ejected by a blower through a surface air cooler (Fig. 4).

Operating pressure within a rectifier is about one millionth atmosphere. a vacuum which is maintained by means of a Langmuir mercury condensing pump, which pumps into a receiver. This in turn is discharged to atmosphere by means of a rotary pump.

Rectifier Auxiliaries

In addition to equipment already mentioned, each rectifier carries an insulating transformer for operating anode heaters, vacuum pump, mercury heater and water heater; selsyn transformer for the grids; single-phase arc-striking transformer; excitation or arc-holding transformer; grid-bias, motor-generator set.

Because these rectifiers operate with the tank and other exposed metal parts close to d.c. line voltage, they are mounted on insulators, and precautions against accident cannot be overdone. At Sterling, each rectifier is enclosed in a metal mesh cage. To open the door of this cage, a man must remove a key from a cubicle in the cage wall near the door. To do this, he must turn the key, and that movement automatically disconnects the rectifier on both the a.c. and d.c. sides. Once he has opened the door, the rectifier cannot be re-energized until the door has been closed and the key put back in the cubicle.

So much at present for the rectifiers. The neutral terminals of the interphase

Fig. 7 — Rectifier: stands on insulators, is in operation only when door of cage is closed

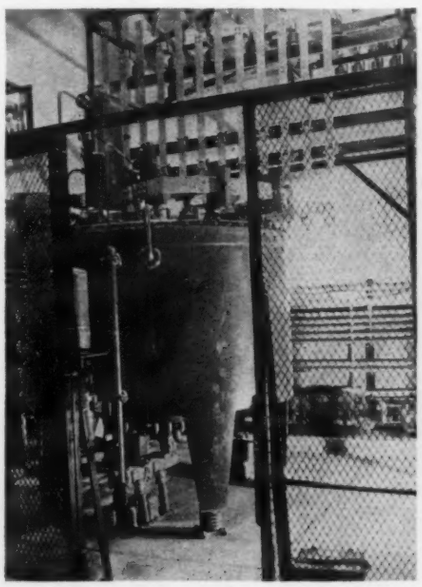
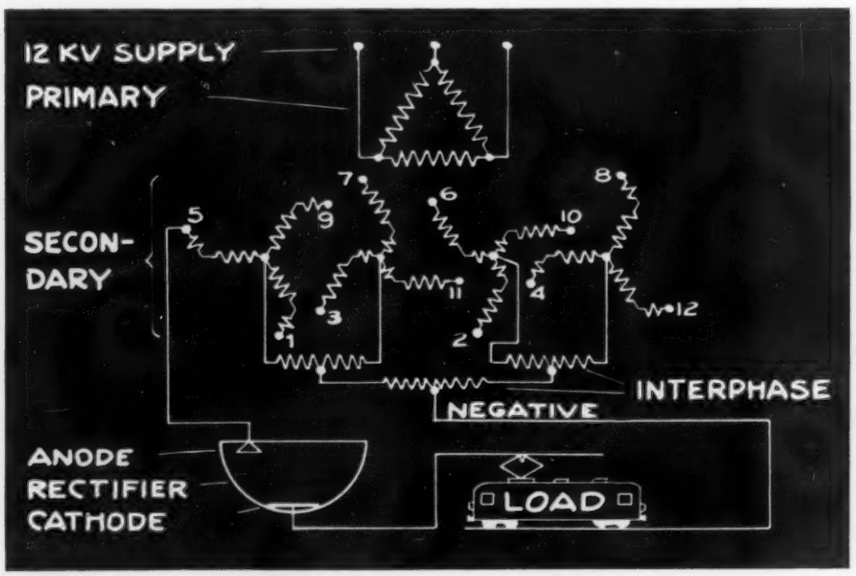


Fig. 8—Diagram indicating schematically the complete circuit from 12-kv. supply through load, with main transformer windings in correct phase relation. Each Y leg goes to an anode



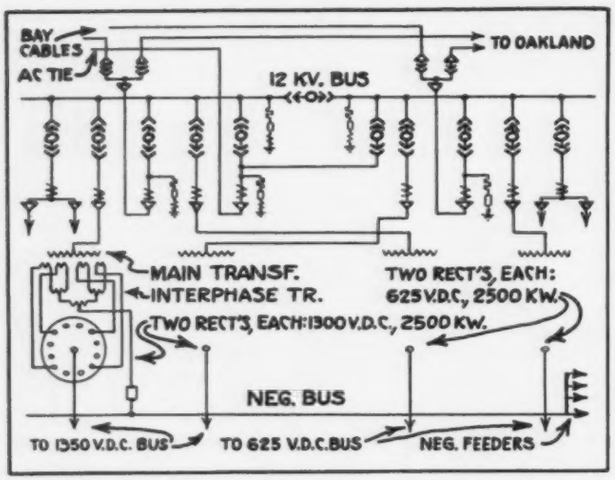


Fig. 9—One line diagram of the 12-kv. a.c. side of Sterling sub. Four rectifiers are installed, positions of three being only indicated

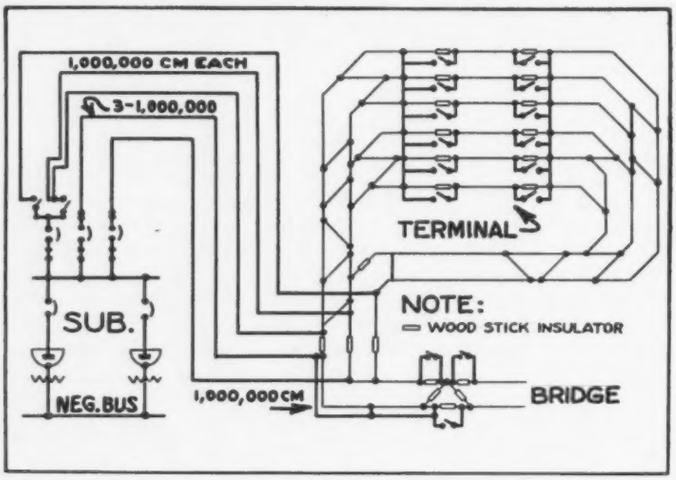


Fig. 10—1,300-volt d.c. side of Sterling substation showing means of energizing catenary in terminal. The 625-volt third-rail system is similarly served

transformers are connected to one negative bus, which in turn is direct connected by copper tubes with 16,000-amp. capacity to the track running rails.

Each rectifier cathode is connected by four 2,000,000-circ.mil rubber-insulated rubber jacketed cables (run in parallel) through a d.c. breaker to the bus of appropriate voltage. Feeders to the catenary and third rail are taken from these busses through d.c. breakers.

Fig. 10 is a one-line diagram of the 1,300-volt d.c. side of Sterling. The breakers are 2,000-amp., metal-enclosed, truck-type, hi-speed (opening in ½ to 1 cycle) on a grounded structure.

The 625-volt set-up is similar except that disconnects are employed on both sides of the feeder circuit breakers. Breakers are of the 4000-amp. panel board type, framework and panel being insulated from the ground. They are semi hi-speed, opening in 2 to 4 cycles. The higher inductance on the third-rail system, arising through the long, paralleling third and running rails, was a factor in this system's employing these breakers, which are less expensive than the hi-speed type.

In addition to operating automatically when the rectifiers are started or shut down, the breakers on the rectifier side of the bus will trip only on reverse current. They are not responsive to overloads.

The feeder breakers, on the other hand, trip on overloads and, by virtue of time-current response, trip on short circuits, even when these are less than overload currents. They will reclose under certain predetermined load conditions.

Bridge engineers pretty well standardized on the use of 1,000,000-circ. mil feeders to the tracks. These appear in Fig. 10. The positive feeders are rubber insulated, rubber-covered, and for both systems are insulated for 5,000 volts. Negative feeders are insulated with 30% rubber compound covered with cotton braid.

Leaving San Francisco, the heavily loaded trains must start their east-bound trip on the evening peak, and must start it on a 20-deg. curve rising to a 4% grade. Hence, the 1,300-volt system carries supplementary feeder capacity 4,000 ft. eastward from Sterling sub. A similar scheme is employed on the approaching grade at the other end.

The 625-volt system also carries extra feeder 3500 ft. east of Sterling. Elsewhere catenaries and third rails are relied on to carry the current.

To cover the contact systems of the two railways would require a story in itself. Suffice it to say, from the power man's standpoint, that the 1,300-volt catenary system, consisting of main messenger, intermediate messenger and two contact wires, has a copper cross section approximating 1,000,000 circ. mils. The 150-lb. third rails, of low-carbon steel, have a copper equivalent of 2,730,000 circ.mils. The guard and running rails constitute the common return, are thoroughly bonded, and are equivalent to 3,500,000 circ.mils of copper per track.

Five automatic tie stations sectionalize the track, using breakers like the subs but polarized to current direction.

While Sterling substation was taken as an example, it is at Mole substation that the whole railway system is controlled. One pair of wires in a 50-pair telephone cable is carried to the Island substation and another to Sterling. Over these two pairs of wires, the system is operated by supervisory control.

Some 35 operations at Sterling sub

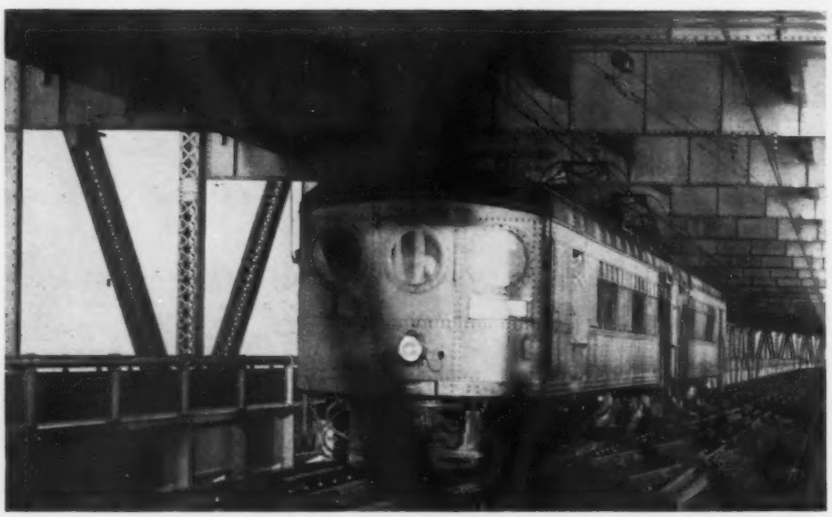


Fig. 11—One of the Interurban trains, this one a 2-car unit, on the bridge. These draw energy from the catenary. At left is the three-lane highway for commercial vehicles, the 6-lane highway for private vehicles being overhead. Union Switch and Signal Co. furnished cab equipment for Interurban. Interurban is a subsidiary of Southern Pacific

can be controlled. The operator can:

1. Open and close all 12-kv. oil circuit breakers.
2. Start and stop all rectifiers.
3. Change taps on the 1,300-volt rectifiers.
4. Close and lock out all d.c. feeders.

The tap-changing equipment is on the high side of the main transformers, and permits Interurban to adjust voltage in six steps from 1,275 to 1,350 volts d.c., operation being under no load. The Key transformers have manually-operated, no-load tap changers, affording four 2½% steps. Thus Key can set its transformers for optimum operation of its trains and Interurban can match its train speed to that of the Key.

In addition to control, the operator at the Mole receives indications of the following conditions at Sterling sub:

1. Direct current on each rectifier.
2. Voltage on the 12-kv. bus.
3. Voltage on the 600-volt bus.
4. Voltage on the 1,300-volt bus.
5. Voltage on the 220-volt house bus.
6. Voltage on the 125-volt d.c. control circuit.
7. Temperature above 175 deg. F. at the substation ceiling (rings alarm).
8. Opening of the substation door.

Thus Sterling is semi-automatic, completely remote-controlled. But most of those 50,000 commuters won't even know its there. More apparent to them, in its effects at least, will be the automatic signal system which controls the trains.

This operates on a 100-cycle track circuit, impulses from which are picked up by two receiver coils on the trucks of the cars. The system operates six visual signals in the train cab. These indicate the maximum speed the train can travel, according to the number of clear blocks that lie ahead. If the motorman does not respond, the train is stopped.

The foregoing, roughly, are the high spots of the job. Two types of electric trains, operating at two voltages over 32 miles of electrified track, 20 mi. of which is main line. The higher voltage system fed by four 2,500-kw. rectifiers, two at each end. The lower voltage system fed by two 2,000-kw. rectifiers at the west end, two 2,000-kw.'s at the middle, and at the east by two 1,000-kv. rectifiers (6-phase) operating in parallel with an existing 1,500-kw. motor-generator set.

Contributing to this $18,000,000 job have been many individuals, many organizations. Among those who played important parts in the electrical construction were: Pacific Bridge Co., $469,236, and Bates & Rogers Construction Corp., $428,363, tracks and third rails; Barrett & Hilp (T. L. Rosenberg, sub-contractor), $370,283, catenaries, feeders and tie stations; General Welding Co., $32,527, bonding; General Railway Signal Co., $1,368,402, signals; Abbott Electric Co., $16,404, telephone cable; California Electric Const. Co., Sterling substation, and H. S. Tittle Co., Mole and Island subs.

Some of these include equipment, principal components of which were furnished as follows, except substation equipment already mentioned: Bridgeport Brass Co., bronze catenary; Anaconda and General Cable, copper catenary; American Steel & Wire, insulated feeder; Ohio Brass, line hardware and insulators; General Railway Signal Co. and General Cable, signals and accessories.

P.G. and E. supervised construction of the substations, saw to getting them on the line, will turn them over to the railways, who will be the joint operators and ultimate owners.

Engineering was by a Joint Power Committee. This group made the decisions and did the work. Its members: S. J. Lisberger (chairman) and F. S. Benson (secretary) of P.G.&E.; Paul Lebenbaum and G. W. Kahler of Southern Pacific; D. L. Babcock and C. Notley of Key System; Walter Evans of Sacramento Northern, and for the Bridge: at first, W. P. Monroe, then Henry Tilson, who took over direct supervision shortly after field work got under way.

Train service across the bridge this month will complete the linking of two great cities, will, furthermore, eliminate ferry connections from the San Francisco end of Sacramento-Northern Railroad's line to the capitol of the state. Sacramento-Northern will operate two-car trains across the bridge, taking energy from the Interurban overhead.

Trains across the Bay Bridge means the end of pedestrian ferry service from Oakland to the historic Ferry Building at the foot of Market St. in San Francisco. But the release of the boats comes just in time, for next month they will be needed to carry visitors to Treasure Island—site of San Francisco's 1939 World's Fair.

Not Plotted

To meet the electrical engineers of Portland in their more relaxed moments, one must visit three groups. At the Electric Club luncheons (second and fourth Thursdays) in the Congress Hotel ballroom, he would find L. W. Going, chief electrical inspector of Portland, in the president's chair. The Club represents all branches of the electrical industry, maintains in its membership a good balance between engineering and sales. It numbers among its past presidents such eminent engineers as F. D. Weber (Ore. Ins. Rating Bureau), E. F. Pearson (NW Electric) and F. H. Murphy (Portland GE), now in sales work. These men are still good attenders, as are many other old timers such as O. B. Coldwell (Portland GE) and O. L. LeFever and Tom Perry (NW Electric) and Harry Schoolfield (PP&L). It would be a ten to one bet he would meet John Summersett (NW Electric) who, it is said, has never missed a meeting.

If you would bask in the rarefied atmosphere of pure engineering, you should attend the weekly luncheon (Tuesday) of the Professional Engineers of Oregon at the Heathman Hotel. Here, in a clubby little room on the mezzanine floor, gather from 30 to 40 of this group's 200 odd membership. This is Portland's nearest approach to an engineers club. It dispenses a fine brand of hospitality, and its guests may turn out to be from almost any walk of life. For instance, at one meeting this year it was discovered that a police commissioner, a purchasing agent, and even a utility sales manager were present.

G. V. Robinson, a civil (Barr & Cunningham, consulting engineers) is president and C. B. Wright, another civil (Portland Gas & Coke) is secretary. But around the U-shaped table were noticed a number of electricals such as Don F. Smith (PT&T), Prof. F. O. McMillan (Ore. State) up for the day from Corvallis, Charlie Knowles (PP&L) of Kennewick, Wash., builder of that company's newer transmission lines in Oregon and Washington, and many old stand-bys from the utilities and manufacturers.

The place to isolate the electricals is, of course, the monthly meeting of the Portland Section, AIEE, generally held in the evening, in the Public Service Building auditorium. Last meeting they were out in force (100 or more) to hear J. D. Ross, Fellow of the Institute, now a Portland resident, tell about Bonneville transmission. C. E. Carey, Ross' chief construction engineer, formerly with Westinghouse in Seattle, gave a spirited account of getting the $15,000,000 transmission project under way in a hurry. Beside the utility engineers were a host of their colleagues from manufacturing companies: Skene Moody and Bill Hynes (G.E.), Verne Wilfley and Charlie Boozier (Westinghouse), Charlie Cutter (Pac. Elec. Mfg.) down from Seattle. Among the consulting engineers was L. E. Kurtichanof, who worked on Bonneville power house design.

Happy situation for Portland's AIEE is the fact that plenty of young men are at the helm, with oldsters giving them support and encouragement. This year's chairman is Charles B. Carpenter (PT&T), son of Dean H. V. Carpenter (Washington State), and Corbett McLean (NW Electrical) is secretary.

Stream Gage

Improved coding device will radio 0.1 ft. levels

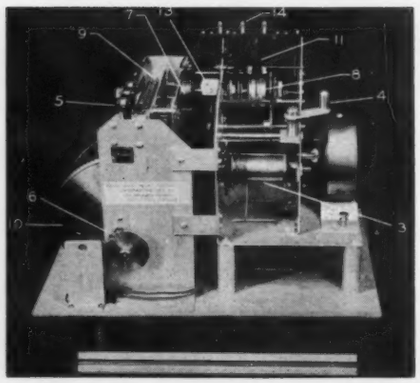
By MAURICE E. KENNEDY

Improvement in stream gaging at unattended stations has been effected by the U. S. Geological Survey, as the result of three years' experimentation by the hydraulic department of the Los Angeles Flood Control District. This work has culminated in the production of a device which reports water levels by radio, every 15 min., to an accuracy of 0.1 ft. Besides being simple and reliable, it requires attention but once a month.

The perfected device is the mechanical part of the sending apparatus, the part which controls the radio, measures the water level, and translates this into a radio signal.

Principal part of the water-level interpreting mechanism is a brass drum, the position of which is a function of water level. It is actuated by a float, to which it is mechanically connected. The drum carries 100 longitudinal grooves on its surface. An 0.1-ft. change in water level causes the drum to rotate through an angle equivalent to the distance between two adjacent grooves on the drum surface. Thus a given groove at a given position, say the top, represents a definite water level.

Each groove is perforated with a series of dots, arranged like a decimal system, each groove indicating an 0.1-ft. higher water level than the preceding one. At predetermined intervals a trolley is motivated, passing three times back and forth along the top of the drum. On the forward trip it makes a series of contacts which constitute a station signal. On the return trip, the perforations in the groove which happens to be at the top of the drum serve as a source of mechanical movement to a weighted contact carried by the trolley. Thus three station signals and three water-level signals are sent out, the three round trips requiring about one minute.



The water level reporter: (3) weight cable drum, (4) weight winding crank, (5) keying trolley, (6) emergency stage setting disc, (7) electric motor, (8) timing discs, (9) chain trolley drive, (10) brass coded drum, (11) mercury switches, (13) gear locking shaft for changes in clock settings, (14) tilting adjustments for mercury switches

Source of power for the trolley is a 6-volt d.c., ½-amp. motor of the permanent-magnetic-field type, similar to those used by model locomotive builders and operating at 9,000 r.p.m.

For timing, a 'Bingo" dollar alarm clock is used, the main spring being replaced with a driving mechanism actuated by a 15-lb. lead weight. This has been found to keep accurate time over long periods of time and with wide variations in driving power. The weight falls 6 in. per day. The clock controls the movement of discs which revolve once a day and once an hour, notches in the discs tilting mercury contacts to close the radio circuit and start trolley operation.

One mercury contact is tripped each 15 min., but the circuit is not closed unless water level has risen to emergency height. In any event, three trips of the trolley reopen the circuit, concluding the report until the next scheduled transmission.

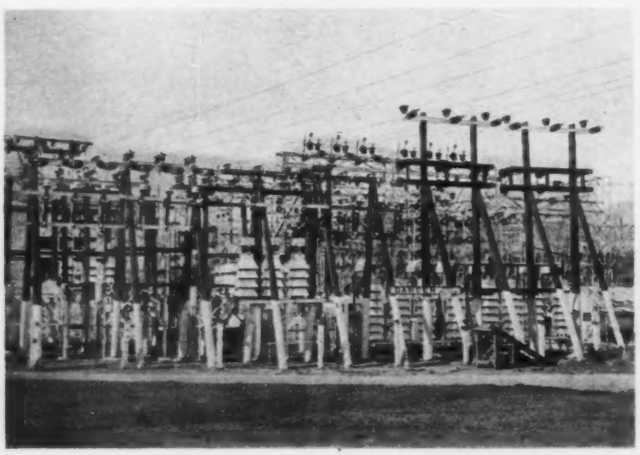
Used by the District in connection with this device are simple 4-watt quartz oscillators. Transmitter tube filament (and trolley driving motor) are powered by a 100-amp.-hr. lead-acid storage battery, capable of two-months' operation on the 15-min. emergency schedule but ordinarily stations are serviced once a month and a freshly charged battery installed. Plate power at 270 volts is supplied by heavy-duty B batteries.

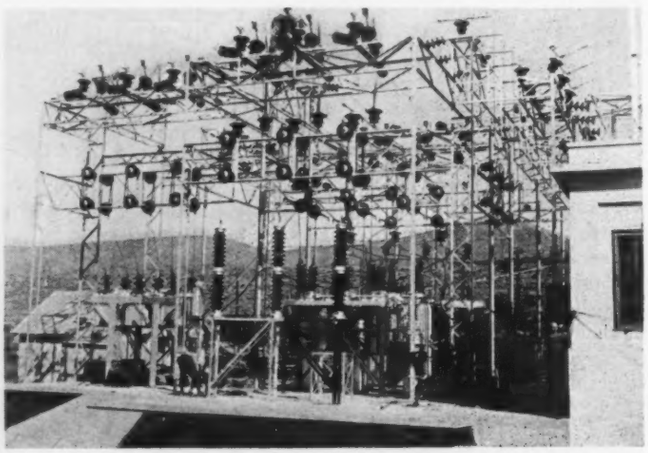
Range of indication is not limited to the single revolution of the drum. Being familith with the trend of water levels, the attendant at the receiving end will be aware of the drum's having passed over the zero point and can interpret the signal correctly by adding 10 ft.

Obviously, the sending mechanism can be used in conjunction with telephone circuits, but these are frequently found less reliable in remote, storm-ridden areas. At present, the District is at work on a receiver for incoming reports which will automatically start, receive, record and shut down.

SIERRA PACIFIC GAINS RELIABILITY WITH MODERNIZED STATION

Part of Sierra Pacific Power Co.'s program of modernizing for greater reliability was this complete rebuild of its 60-kv. switching facilities at Washoe substation. The rebuilt structure (right) provides for a new incoming 60-kv. feeder which gives Sierra Pacific a second tie with Pacific Gas and Electric Co. Equipment includes a new voltage regulator and new oil circuit breakers. Insofar as possible, the entire structure was factory assembled. It was laid out by Sierra Pacific engineers, then worked out by Pacific Electric Manufacturing Co., which furnished steelwork, disconnecting switches and tubing. The 23-kv. side of Washoe (left) shows how the 60-kv. facilities looked before replacement. Modernization of this section is proposed





Star

How G. A. Noonan of Portland makes buyers out of prospects

BY HENRY W. YOUNG

It was during a free-range wiring campaign in Portland some years ago that a salesman star shot across the sky of national recognition. The personal record that salesman made was the selling of 318 ranges in 14 weeks, five days—an average of 3.87 per working day.

Some said that this salesman, G. A. Noonan, of Jennings Furniture Co., was sitting in a sweet spot as manager of a large electrical appliance department. In a sense, they were right. But it should be pointed out that he was, and still is, the only regular salesman employed in that department. Occasionally he is assisted by free-lance salesmen from other parts of the store. For the most part, however, he sells from the floor and outside during other than store hours. He's still going strong.

Probably 75% of Noonan's sales are made by tactics distinctly his own. He has built up the merchandising plan on which the department operates. Watch him sell for an hour or two, and the first, most impressive thing you will hear him tell the customer is to shop elsewhere and compare. At the same time, without actually asking for a deposit, the suggestion is made that the prospect put up $1 as an option on the particular range he likes. If real interest is aroused, Noonan usually gets this. A receipt is given as an informal acknowledgment. But Noonan points out that this is not an order; that he wants the prospect to look around and compare this range with the best. In the meantime, he will put a "sold" tag on the range and hold it for final decision.

This seems to be trivial business, trying to get a dollar deposit on a $100 article. But it's done with a purpose. Carefully kept records show that 90% of these options turn into sales.

One young couple, for instance, came in one day and listened to Noonan's sales talk. They liked a particular model, but were non-committal. The talk and demonstration were thorough but without result. After he had told the story, Noonan adroitly suggested the dollar option. Once, twice, three times—no go. Finally the youngsters decided to leave. They were at the elevator when Noonan took a card from his pocket and threw it on the floor. "If you saw this on the sidewalk and it was a $20 bill, would you pick it up?" he asked. "Or would you say to yourself that you would be coming by tomorrow and could get it just as well then?"

The young man saw the point. "Oh, let's give him the dollar and take the option. It won't do any harm, and after all, that stove might be gone if we decided on it later."

Twenty minutes later they were back in the store. Noonan was busy with another customer. A nod and a smile were all the young couple got. When Noonan is talking to a customer, Mrs. Astorbilt might come in; but he stays where he is and concentrates on the sale in hand. So the couple went back to their optioned stove and examined it again. Finally, having to answer the phone, Noonan passed by them and paused. They were eager to sign up right then. Did Noonan leave his prospect and take them down to the office? He did not. He thanked them and asked if they would go down to the office by themselves. Which, of course, they did.

G. A. Noonan, crack range salesman

I asked Noonan about this little wrinkle in selling. He answered: "First, thoroughly sell your merchandise, making every point clear by words and demonstrations. Don't try any closing tactics until this is done. Let nothing disturb you—not even other prospects. If you flit about, you're lost.

"If the prospect is a woman, the chances of closing then and there are all against the salesman. She must talk with her husband. But a woman always has a dollar. Try to get it, for in her mind she at once assumes ownership of the range and it becomes *her* range. Then urge her to go out and see all the other makes. Try to keep her from doing this, and she will shop all over town. But urge her to do it, and she will go to few if any other places, for your attitude has shown that you believe your range is the best. She then goes home and does as good a job on her husband as you could do.

"When a dollar has been paid, I try to forget it. Do not pester the prospect. Give her plenty of time to decide. One lesson I learned I'll never forget. I had three prospects one day years ago that were hot. I had their names and addresses on cards in my pocket. I was prepared to give them a concentrated follow-up.

"The next day I looked for the cards and they were gone. And I couldn't remember any of the names. So three good sales had gone on the rocks.

"Some weeks after that, however, two of these people came in and bought ranges. And in each case they told me that I had got the sale because I hadn't pestered them."

How Much?

What the Los Angeles Bureau found out about water heaters

BY HUBERT M. LANGLOIS

On the average, on a big system, how much energy does a water heater use? How does this vary with the number of persons served and with the kind of home in which they live?

These were questions the Los Angeles Bureau of Power & Light set out to answer. Results are summarized herewith.

The forthcoming sale of 1,102 electric water heaters is a spectacular demonstration of the study's worth. Largely on the basis of consumption figures accumulated in this study, architects and owners of Wyvernwood Housing Project, Los Angeles, accepted electric water heaters for their development before reaching decision on any other modern electrical appliance. This low-cost housing project, when completed in 1939, will cost $6,000,000 and accommodate 1,102 families in 143 structures of two stories each.

Method of arriving at consumption was by separately sub-metering 2,447 units which the bureau designates as "approved" electric water heaters. These are two-element units, with base-element time-controlled, which conform to certain specifications as to design and size.

Approved heaters must have base elements of 25 watts per gal. and booster elements of 50 watts per gal., and must be of specified manufacture. Their minimum size is based on the number of bedrooms and bathrooms served, according to the schedule in Table I-A.

Purpose of the requirements is to assure customer satisfaction in advance, and the means of enforcement is the customer's ability to qualify for the off-peak rate.

For purposes of the study, all approved water heaters in regular serv-

SALES PARADE

Table IA—"Approved" Heaters
Minimum Storage Capacity (gal.) Required for Various Combinations of Bedrooms and Bathrooms

No. of Bedrooms*	No. of Bathrooms Served					
	1	2	3	4	5	6..
1	30					
2	40	50				
3	50	60	70			
4	65	75	85	95		
5		90	100	110	120	
6			110	120	130	140

* The term "bedrooms" refers to the maximum number of rooms which would be designated as bedrooms in a building plan from structural consideration.

Table I—Distribution by Size of Family

No. in Family	No. of Water Heaters	Per Cent of Total
1	151	3.7
2	1586	39
3	1230	30.2
4	696	17.1
5	248	6.1
6	88	2.2
7	38	0.9
8	20	0.5
9	12	0.3
Av. 2.97	4069	100

Table II—Distribution by Tank Size

Tank Gallons—Group	No. of Heaters—Group	Per Cent of Total—Group
30-32	449	18.3
40-42	1218	49.8
50-55	477	19.5
60-70	186	7.6
80-86	78	3.2
105-140	39	1.6
(Av., 45.6 gal.)	2447	100

Table III—Monthly Consumption and Billings (Customers Having One "Approved" Water Heater)

No. of Persons Served	No. of Customers	Kw.-Hr. per Customer: Water Heating Only	Kw.-Hr. per Customer: Total Service	Billings per Customer: Water Heating Only	Billings per Customer: Total Service
1	151	154	285	$1.08	$ 4.52
2	1586	213	417	1.49	6.01
3	1230	262	489	1.83	6.64
4	696	306	572	2.14	7.44
5	248	339	640	2.37	8.10
6	88	393	715	2.75	8.75
7	38	469	753	3.28	8.80
8	20	600	1028	4.20	11.52
9	12	443	801	3.10	9.55
Av. 2.97	4069	257	488	1.80	6.66

Table IV—Consumption by Various Domestic Consumer Groups

Class of Customers	No. of Customers	Kw.-hr. per Customer per Month	Monthly Billing per Customer
SYSTEM TOTALS			
All domestic consumers	344,028	66	$2.04
Major appliance group only**	10,675	282	5.10
Domestic consumers exclusive of maj. app. group**	333,353	59	1.95
SPECIAL WATER HEATER STUDY			
All cases in study†	4,069	...	...
Total service	...	488	6.66
Water heating only*	...	(257)	(1.80)
10% highest water heating use cases†	406	...	...
Total service	...	937	10.77
Water heating only*	...	(531)	(3.72)
Water heater cases having ranges	3,110	...	...
Total service	...	515	6.96
Water heating only*	...	(262)	(1.83)
Water heater cases without ranges	959	...	...
Total service	...	401	5.51
Water heating only*	...	(247)	(1.73)

** Major appliance group consists of customers having ranges, water heaters or space heaters (other than small portable space heaters).
* Figures in parenthesis relate to submetered water heating averages only, but are included in total service use.
† Without regard to whether range is installed.

Table V—Monthly Consumption for Various Room Combinations

Service Condition: No. of Rooms Bath	Bed	Typical Water Heater Cases: No. of Cases	Av. Persons Per Case	Av. Kw.-Hr. per Case	Av. Kw-Hr. per Person	10% Highest Water Heater Cases: Av. Kw.-Hr. per Case	Av. Kw.-Hr. per Person
1	1	843	2.2	204	93	367	167
	2	1948	2.8	249	87	432	151
	3	475	4	314	79	543	136
	4	20	4.4	325	74	444	101
	5	3	5.3	453	86	453	86
		(3289)	(2.9)	(246)	(85)	(432)	(149)
2	2	109	3.1	329	104	598	190
	3	234	3.7	354	96	674	182
	4	38	4	465	116	742	186
	5	6	6.7	700	104	700	104
	6	3	7.3	508	78	508	78
		(390)	(3.6)	(365)	(101)	(661)	(184)
3	3	48	3.7	466	126	679	183
	4	54	4.6	552	119	911	196
	5	9	5.5	752	137	787	143
		(111)	(4.3)	(531)	(123)	(786)	(183)
4	4	15	3.5	753	215	1058	302
	5	7	5.3	887	167	1153	218
	6	1	4	511	128	511	128
		(23)	(4)	(784)	(196)	(1063)	(266)
5	5	2	8	1616	202	1616	202
	7	1	4	786	197	786	197
		(3)	(6)	(1339)	(200)	(1339)	(200)
All Cases		3816	3	271	90	470	157

ice during August 1937 and February 1938 were metered. Excluded were those where opening or closing bills existed, where complete data were not available or where units installed for less than one month were involved. Also excluded were those installations which involved one water heater serving more than one family, or one residence being served by more than one heater.

Tables I to IV inclusive, therefore, are an endeavor to portray a true system average. In connection with these it may be observed that in Los Angeles the use of furnace coils or systems with circulating return pipes is practically unknown.

Table V is a further analysis. Here, 131 cases for August 1937, and 122 cases for February 1938, have been left out. These cases are those where less than 75 kw.-hr. per month were used by a heater serving one person, or less than 100 kw.-hr. by a heater serving more than one. Here again the desire was to obtain a system average, and it was considered that such use would exert an abnormal influence on averages which were being determined for purposes of establishing a relation between consumption and such variables as number of bathrooms, bedrooms and persons served.

The numbers of persons, as tabulated, are those shown by records in the Bureau's files. There is, therefore, some discrepancy. But because the file records are, as a whole, relatively young and rapidly growing, it is logical to assume that changes in number of persons served by one unit are largely compensatory and do not appreciably affect averages of the larger groups.

Table V is subject to some degree of error because of the greater influence in smaller groups of changes that may have occurred in numbers of persons actually served without corresponding changes in the file.

With Table V as the fundamental guide, the bureau has evolved the following rule and is using it in water heating promotional efforts:

The average monthly water heater kw.-hr. consumption is equal to 40 times the number of persons served plus 135 times the number of bathrooms.

The bureau's off-peak water heating rate is 0.7c per kw.-hr. For the bureau system, therefore, the following simple formula applies:

Average monthly water heating bill ($) = $0.30P + 1.00B$

Where: P = number of persons regularly served.

B = number of bathrooms in home

Reference to Table V will reveal,

however, that 10% of the water heating customers will *average* 70 to 100% greater use than the average for the system as a whole. Care must be taken in applying the formula to any individual case.

The formula represents a system average. So used, it serves as a convenient, practical guide to the operating costs that may be expected in the majority of cases.

Recordings

Idaho Power teaches its salesmen to say the right things

Nothing like hearing yourself talk to discover the mistakes you make. Idaho Power Co.'s sales department discovered this in the use of recording devices which have become part of the standard training equipment of several departments. Results have been improvement in sales presentations, in home demonstrations and even in the responses of order and complaint clerks.

Ralph Gale, commercial manager, conceived the idea when he was a division sales manager at Twin Falls. He used phonograph recording equipment then but found it unsatisfactory.

When he became commercial manager, he obtained complete recording equipment for 33-r.p.m. records playing five minutes to the side. The kind of records used can be treated to make an immediate play-back. This permits a quick checkup on the type of sales talk presented. Portability makes it possible to carry the equipment from division to division.

How did the salesmen react to the idea? They got so angry with their faults that they wanted to do the job over again at once. Sales talks were rehearsed in advance, then presented for recording. The first ones were full of "hems" and "haws" and other uncertainties. More recently, a fine improvement has been noted.

Fred Ingraham, merchandise manager, now uses the equipment to save time. After listening to the records, he writes the salesmen suggesting improvements.

For checking on the order and complaint clerks at the desks, the microphone was hidden under the desks for recording the conversations between customer and clerk. In this way, great improvement was made in the manner of handling customers.

In the "Hold the Load" campaign on commercial lighting last year, Orland C. Mayer, manager of commercial and industrial sales, used the mechanism to check the sales story of his crews meeting typical customers. The salesmen were found excellent in two parts of their presentation, but poor in others. They knew how to handle complaints and what to say when the prospect turned out to be a good lead for more business. But they were not good in talking to customers who wanted to cut down their load. Nor was their public relations story as well worked out as it should be.

It was found that the salesmen were using the wrong wording. That is, they left themselves open, like a boxer who does not cover himself, for a comeback. As a result, uniform talks were prepared.

These are not canned talks, but they seek to avoid wrong combinations of words which lead to misinterpretation or to a wrong reaction. The sales messages are based on the "advantage, proof, action" grouping and were designed to stop the "recession thinking" of store owners and restaurant proprietors who had a tendency to cut down present use. They were outlined to sell the customer on his present use, to show him the disadvantages of decreasing his use and to prepare him to buy more at a fairly low cost in the upper brackets of the rate.

To teach public relations, the Daniel Starch course was given employees. A checkup on its application was made through these recordings.

Most valuable feature of the recordings, as a means of improving speech, has been the way in which they have corrected the speaker's mannerisms. No longer is there any embarrassment in telling him that he says "'ouse" instead of "house." He hears for himself and makes his own effort to improve.

Revision

Portland G. E. announces changes in its sales policies

Having closed its appliance stores, Portland General Electric Co. last month put into effect the following revised sales policies:

Dealers now arrange for the delivery, installation and connection of ranges and water heaters sold by them. They employ contractors of their own selection to provide the necessary wiring, plumbing and connecting.

The company continues to finance the cost of range and water-heater circuits and plumbing for dealers, billing the customer in monthly installments with the electric service bills. Range owners who desire the company to disconnect and reconnect their ranges when they move are charged 50c for disconnecting and $2.50 for reconnecting. Included in the reconnecting charge is the 50c charge for the necessary wiring permit.

Ranges and water heaters will be serviced by the company during the guarantee period without charge. After the guarantee period has expired, replacement parts are billed the customer as in the past.

Post-Audit

Of attendance at pre-Xmas shows reveals several new records

Gone and probably forgotten is Christmas. But sponsors of the West's outstanding pre-Christmas electrical shows have not yet forgotten the successes they scored.

To the oldest show (6 yr.) went top honors. A new record of 102,000 visitors was hung up by the San Diego Bureau of Radio & Electrical Appliances' venture. This topped the 1937 mark—the previous high—by 12,000.

Showmanship and sex at Denver's electrical exposition. Use of the Polaraid sheets (one panel shows at right) turned the colorless bridal costume into, as one reporter put it, "a dazzling symphony of chromatics"

The Rocky Mountain Electrical League's Denver show also set a new record. Official attendance was 19,468, an increase of 6,000 over 1937. And in Casper, Wyo., the league's show attracted over 6,000 visitors.

(These league figures do not take into consideration the unknown attendance of the smaller expositions held in the six states of the league's territory.)

Showmanship was, of course, rampant in all the shows. J. Clark Chamberlain, bureau manager, reported that "exhibitors were encouraged to install and operate attention-getting displays. As a result, we had amazing action. Thermador, for example, installed their new steam accumulator and had it hooked up, with steam constantly floating from it. G-E Supply Corp. demon-

strated the 1,000-watt peanut-tube lamp about every five minutes and fluorescent all the time. San Diego Neon had a real showman who 'swallowed electricity,' made sparks shoot from his fingers."

Fanciest stunt was staged in the Denver and Casper shows, however. A "Polaroid Bride," costumed in transparent cellophane, paraded between two 6-ft.-square panels of Polaroid.

COMPARISON OF B. C. ELECTRIC RAILWAY'S 1938 and 1939 RETAIL DEALERS' COOPERATIVE SALES PLANS

1938	1939
(1) CLASSIFICATION OF DEALERS Advertising allowances on ranges and refrigerators to be paid to department stores and preferred dealers handling a full line of appliances and all other dealers having stores in which some appliances are displayed regardless of whether such dealers had ranges and refrigerators on display.	Advertising allowance will be paid on range and refrigerator sales only to dealers who have ranges and/or refrigerators on display and are officially recorded with the company by the distributors as a recognized dealer outlet for the manufacturer's appliances. (I.e., The various manufacturers and distributors will be asked to supply company with a complete list of dealers at the beginning of 1939, and to advise of any changes in the list after that date.
(2) 10% DISCOUNT TO BUILDING CONTRACTORS There is a clause granting 10% discount to building contractors who install appliances in a home at the time of building.	This clause will be eliminated, as it was not used.
(3) ADVERTISING ALLOWANCES Combination model electric or gas ranges —advertising allowance, $3.	Advertising allowance on these appliances will be reduced to $2.50 per range. Allowance on other ranges and on refrigerators will remain as in 1938.
(4) FREE INSTALLATION (a) Electric ranges—maximum installation allowance, $50.	(a) Maximum installation allowance, $35 —customer to pay balance to B. C. Electric, such balance not being handled by dealer direct. Average total cost: $42.50.
(b) Allowance of $35 for wiring installed in a new home, payable to owner or speculative builder, as the case may be, will be applicable when a new range is purchased or a used range transferred.	(b) Only allowance for wiring in new home in which new electric range, purchased from recognized dealer, is installed will be standard $35. This allowance payable only to party who signs electric service contract. No allowance for transfer of used range by customer from previous address other than $17.50 allowance granted under transfer clause (this, provided customer has used electric range service continuously for past 5 years). N. B.: Speculative homes, where building permit was taken out prior to Dec. 31, 1938, will be covered under 1938 sales plan.
(c) Where an electric range is transferred to unwired home by present range customer, 50% allowance will be granted if customer has used range continuously for past 5 years. Average allowance under this clause has been $21.25.	(c) This allowance made straight $17.50, provided 5-yr. use of range is proved.
(5) SIGNED APPLICATION FOR ORDER CARDS 10% bonus granted on ranges, refrigerators and other major appliances where dealer obtained signed application for order card and company handled sale.	10% bonus and use of signed application for order cards for all appliances except storage water heaters will be eliminated. Dealers who cannot close and handle sales will receive prospect bonus for prospects turned over to company.
(6) ELECTRIC RANGE TRADE-INS (a-1) $25 allowance for old electric range when a new electric range is purchased.	(a-1) This allowance reduced to $20, and stipulation made that new range must be valued at $100 or more.
(a-2) Where customer moved into a new home and also had an old electric range to trade, $35 wiring concession and trade-in allowance were granted.	(a-2) Customer will have option of buying new range and obtaining $35 wiring allowance, or of trading in old range and receiving trade-in allowance. He will not receive both concessions.

Sales Plan

About the major alterations made for '39 by B. C. Electric Railway

To be announced to British Columbia dealers this month is B. C. Electric Railway Co.'s "Retail Dealers' Cooperative Sales Plan for 1939."

The plan, in principle, follows very much along the line of the one used in 1938. Its purpose is to help dealers operating in the utility's territory by means of cooperative sales promotion events.

One important feature in the 1939 plan is the identical installation concessions made available to customers whether they purchase their range, etc., from dealers or the company. Advertising bonuses are paid to dealers for their direct sales of electric and gas ranges and refrigerators.

Main points of comparison between the 1938 and 1939 plans are shown in the accompanying table.

Cooperation

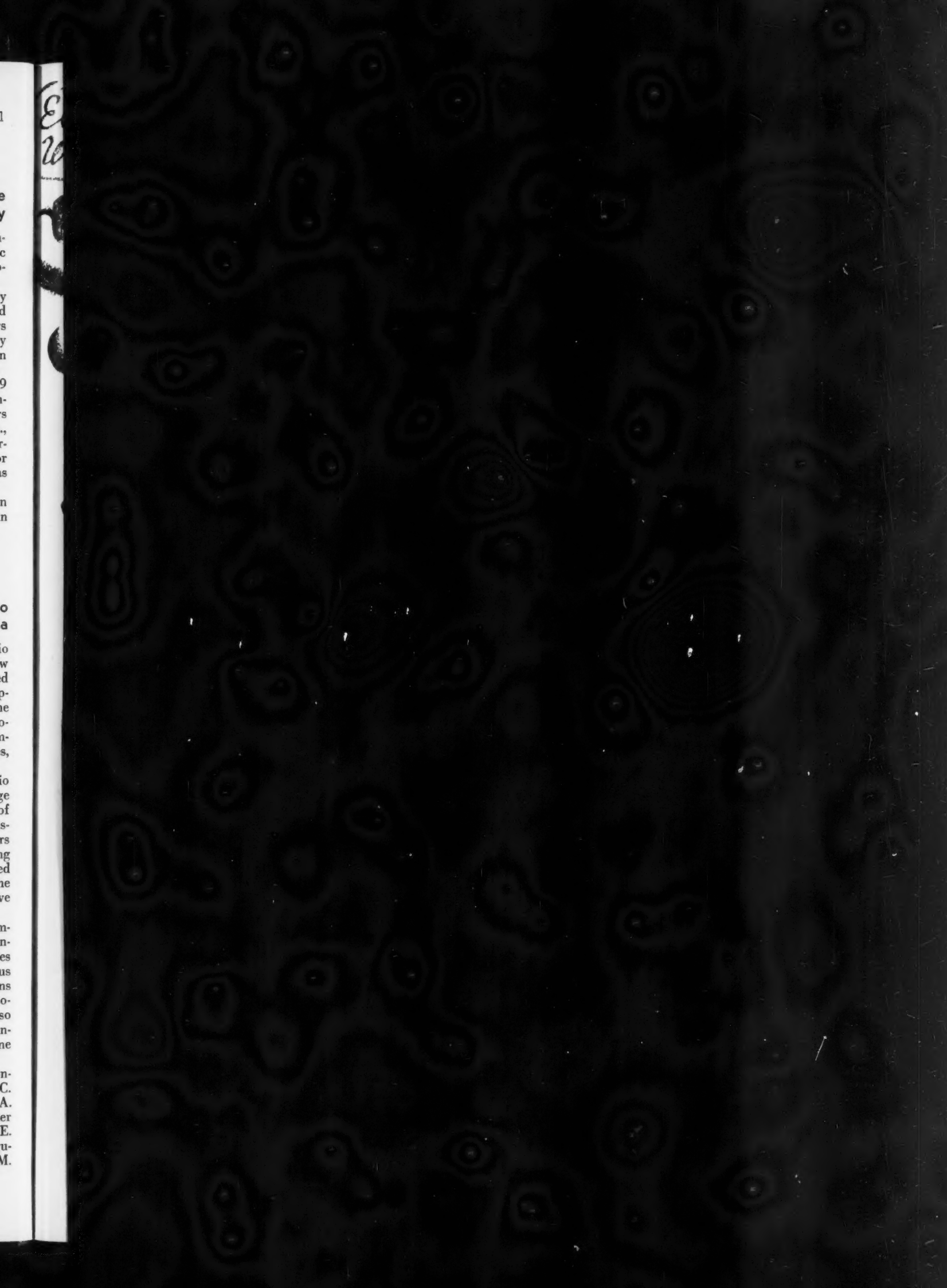
Is the keynote of a new drive to sell appliances in British Columbia

Cooperative effort to promote radio and appliances and to introduce new models to the public has been launched at Vancouver, B. C., by the Home Appliance Council, a subsidiary of the Electrical Service League of British Columbia. The council has four sub-committees covering refrigeration, ranges, radio and laundry equipment.

The idea was first tried out on radio in October. Issued was a four-page newspaper supplement on the joy of radio ownership. Additional advertising, in which various manufacturers and distributors united in presenting their lines, followed on pre-determined dates. Dealer displays rounded out the effort. Result was an extremely active October radio market.

Because of the success of this campaign, the council has decided to inaugurate further cooperative activities on other major appliances. The various sections of the council will draft plans to tie in with the merchandising program of B. C. Electric Railway Co. so that the industry as a whole may concentrate on a single appliance at one time.

The radio committee which sponsored the experiment consists of: W. C. Clarke, chairman; J. Johnston, A. Forst, G. L. Bell and F. A. Boyle. Other committees are: Refrigeration—J. E. McCormack, chairman; P. D. Ferguson, E. Ormsby, R. Brown and M.



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No. 1-c JANUARY, 1939

Electrical West

Sales Guide

Ever Lose a Sale?

Maybe this was the real reason

If you are a dealer—

You lose business when your customers cannot use electricity freely and conveniently.

That gives **you** a stake in wiring, like it or not.

It is good business for you to do what you can to stimulate your customers to have more wiring put in.

Why? So that they can buy more of the merchandise you stock to sell them.

In the past you may have cussed wiring, thought it just a nuisance.

Don't do it out loud!

It hurts your business to do that where customers can hear you. Makes them delay buying something they may want for fear they can't use it.

Talk up wiring instead, it is better for you.

You may have thought it none of your concern.

But when it chokes your market, it **is** your concern.

For instance, here's what more wiring would do.

1. **Increase your business**
   The adequately wired 5 room house is a market for $1,200 worth of electrical appliances, lamps, and fans, not counting a stoker, oil burner or heating, or all-electric kitchen.
2. **Make selling easier**
3. **Reduce selling costs**
   by removing inadequate wiring as a sales resistance.
4. **Reduce service costs**
   Less merchandise sold would be brought back with complaints that were really due to poor voltage.
5. **Repeat business**
   from the same satisfied customers who received their money's worth from your previous sale.

It is worth while, then, to talk adequate wiring to your customers, to have your salespeople also take it.

What to say is simple. No need to be complicated or technical. Just look inside this Guide for hints.

If you are a salesman—

You are losing sales every day because customers cannot use what you sell.

Their wiring "can't take it."

That puts you decidedly on the side of **more wiring.** So whenever you have a chance to put in a word and influence people to put in more wiring, it means a lot to you. Do so.

Here's why:

1. **It will make your selling easier** later.
2. **Less resistance to overcome** making the sale.
3. **Less service nuisance** after the sale. Often the fault is not with your appliance but with the customer's wiring at home.
4. **Permits you to earn more** since the more you sell, the better your job.
5. **Turns your customers into boosters** that send others to you to be sold.
6. **Insures your job and income** because your customers can keep on using other new appliances—up to the saturation point of their wiring—and you can sell them.

If you are a contractor

Nobody has to tell you that more wiring means

1. **More business to you**—installing it.
2. **Less shopping around for bids** when the customer is convinced that you will satisfy a lot of real needs.
3. **More profit from your job** that you sell without competition on the merits of the work and service.
4. **Less cutting down** of the specifications, so that you can sell better materials at a better mark-up.
5. **Enough work to keep your men,** the good mechanics you like to have stay with your shop.
6. **Work to do** even when new building is slack, putting in adequate wiring in old houses.

So whenever you, or your men get a chance, talk of wiring in the customers' language, as suggested inside this Guide.

What Adequate wiring means to You

What to Say Since it Means More

Make it Simple to Get Results

First off, you ought to know that **"Adequate Wiring"** is in the plain everyday language that your customer uses.

If you are asked there's no need to get fussed up with a lot of technical talk.

Here's what adequate wiring is, in words of one syllable—

1. Big enough wire

If all the faucets in your house were running there wouldn't be much pressure at the hose outside unless you had big enough pipes coming into the house. Same with electricity. You need wire big enough to furnish plenty of electricity at any lamp or appliance plugged in.

2. Enough outlets

Places to plug in appliances and lamps, conveniently located so that you can find them and use them without moving furniture or running a lot of cord around.

3. Enough switches

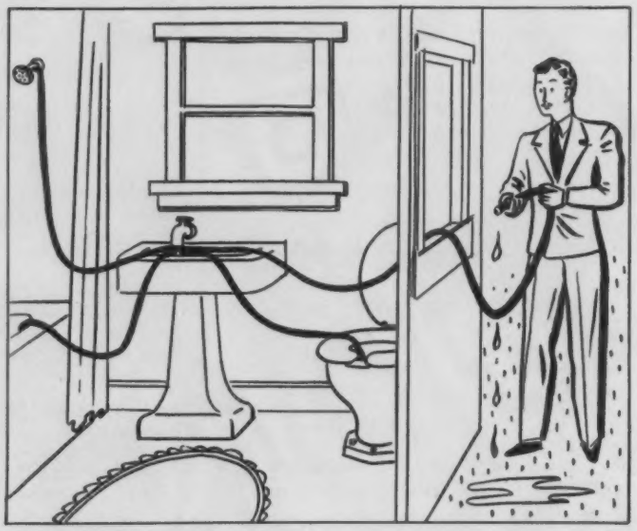
So that you can turn on lights ahead of you and not have to grope around in the dark.

4. Enough reserve capacity

Simply means that the wire and main switch and other facilities are big enough to use new appliances when you buy them without going to a lot of extra wiring expense.

How the customer is to get these things is the contractor's business. He knows the technical details required. He has the materials and the men and knows the codes. Let him do a good job instead of encouraging anyone to try makeshift stunts with cords.

Advise your customers to see a good contractor.



Ridiculous—if plumbing were like this—

Worth talking wiring, isn't it, when a word from you may start a customer thinking?

A lot of salesmen make the mistake of complaining about wiring to their customers, or of agreeing with their customers' complaints.

They forget that such an attitude discourages buying.

If it seems like too much trouble to use the appliances you sell, they won't buy.

So talk up, encourage customers to put in more wiring instead.

Like the examples across the page—

STAMP OF APPROVAL

Recommended by Your

THE MONTANA POWER CO. • UTAH POWER & LIGHT CO.
IDAHO POWER CO. • CALIFORNIA OREGON POWER CO.
ROCKY MOUNTAIN ELECTRICAL LEAGUE

Sales to You

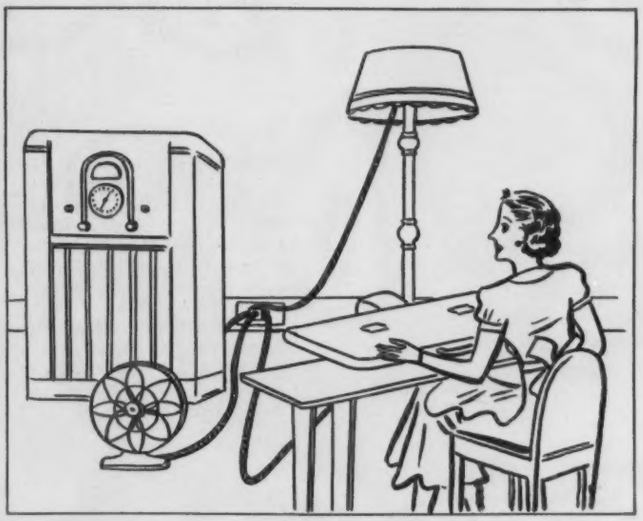
Here's how you can help—
(and help **yourself** at the same time)

Whenever you get a chance, say something like this to your customers and friends:

"Have you ever thought of bringing your wiring up to date? 'Twould make it more convenient to use your modern electrical appliances and you'd find they operate better, too. It's like having leaky, old plumbing in a house to put up with old and inadequate wiring in this electrical age."

Or—when an appliance comes back with a complaint—

"Horse and buggy day wiring, maybe that's why you are not getting your full money's worth out of this appliance. Funny thing about houses. When they are built we seldom think of what they will need in the future. But the world moves on and there are always new electrical things we can use to advantage. Our houses don't keep pace. Why don't you fix it for a long time to come by having some bigger wires and more outlets put in? It will pay you back in electrical savings later."



—but many homes have wiring like this

Or on selling an I.E.S. lamp—

"If you find you haven't all the outlets to plug this fine lamp into that you'd like, why don't you call in a contractor and have more put in? The benefit your eyes will get from this lamp makes it very worth while to put in enough wiring and make it convenient to use. Did you know that you will get more light for your money if you have big enough wires feeding it?"

Or when a contractor talks to the future owner of a new house—

"You're building a fine house here. You will get lots of pleasure out of it. Yet, if you don't mind my suggesting it, you may not be looking into the future, as far as your wiring is concerned. It has been my experience so often that after people move into a new home they find a dozen more places they wish they had provided with receptacles—or outlets in which to plug electric things. There are always places you'd like to use a new lamp or a sewing machine or to plug in the vacuum cleaner. Why not let me put them in now before the walls are all covered over? It will cost more to have it done later. Why not save money by doing it now?"

Or in a fewer words—to plant the idea—

"Your appliances act anemic? Probably starved for electricity. Better feed them with bigger wires."

"**Tight wires** in your house, no doubt? Overworked wires carrying more than they were meant to. Can't do your jobs for you as they ought to."

"**Full comfort wiring,** that's what you need, what everyone needs in an electrical age like this. Why not look into it?"

Or if they ask what it will cost—

"What'll it cost? You'd be surprised to realize it won't cost more than a few dollars a month on one of these modernization loans. Well worth the expense, you'll find it, everyday."

to

reduce your
Sales-resistance
talk up

Adequate Wiring

Sales Allies —
PUGET SOUND POWER & LIGHT CO.
PORTLAND GENERAL ELECTRIC CO.
WASHINGTON WATER POWER CO.

What to do—

Just Good Sense—

As long as "crowded wiring" holds back your Business—keep on promoting Adequate Wiring

Good farmers plow in the fall. The ground will be better for it next spring. It is just as good sense for anyone in the electrical business to plow up future prospects by promoting Adequate Wiring at every opportunity. Their future business will be better for it, their jobs more secure. It doesn't take much breath or energy just to keep talking and suggesting Adequate Wiring. That's the best thing to do. It does not cost much more to hand out to customers and friends the well-prepared easy-to-understand pamphlets and envelope stuffers that you can get from the National Adequate Wiring Bureau, 155 East 44th St., New York. Most likely you can get them from your local power company. Ask and see. Or write for samples.

Householders are folks who either live in a home they own or are planning to build a new home someday. In either case they will be better customers someday if they know they should have more wiring. One of the snappiest pieces of literature you can put in their hands is the one at the right, "Check your Wiring." Read it yourself too, so that you can use the information it contains to persuade and sell.

YOUR HOME WI
YOU NEED
Adequate Electrical Wiring
BECAUSE
Check
YOUR WIRING
BECAUSE Home wiring is your part of the path along which your supply of electric power must travel — from the power company's generators to the many points in your home where you use it. Full voltage is delivered to your meter, but your own wiring system must be adequate to deliver the electricity at full voltage to lamps and outlets if you are to obtain the full measure of comfort, convenience, economy, efficiency and safety to which your payment of your electric bill entitles you.
BECAUSE Adequate Wiring will provide: enough lighting and convenience outlets for all your electrical needs; proper switching facilities to control them; large enough core of copper in the wire to conduct economically a full measure of electrical energy to lamps and appliances.

A whole campaign of folders and booklets is available if you want to promote Adequate Wiring through a local league or association. Titles give you an idea of their message—

Copper in the Home. A Pictorial Primer on Adequate Wiring. Electricity is Cheap. The Nerve System of your Home. Electricity and Lighting. Electricity for Comfort and Convenience. Electricity and Modernization. Help Yourself to a Hobby. Wiring Economically. Wiring with Confidence. Can a Tenant Afford Good Wiring? When to Wire. Before you Rent—Build—Buy.

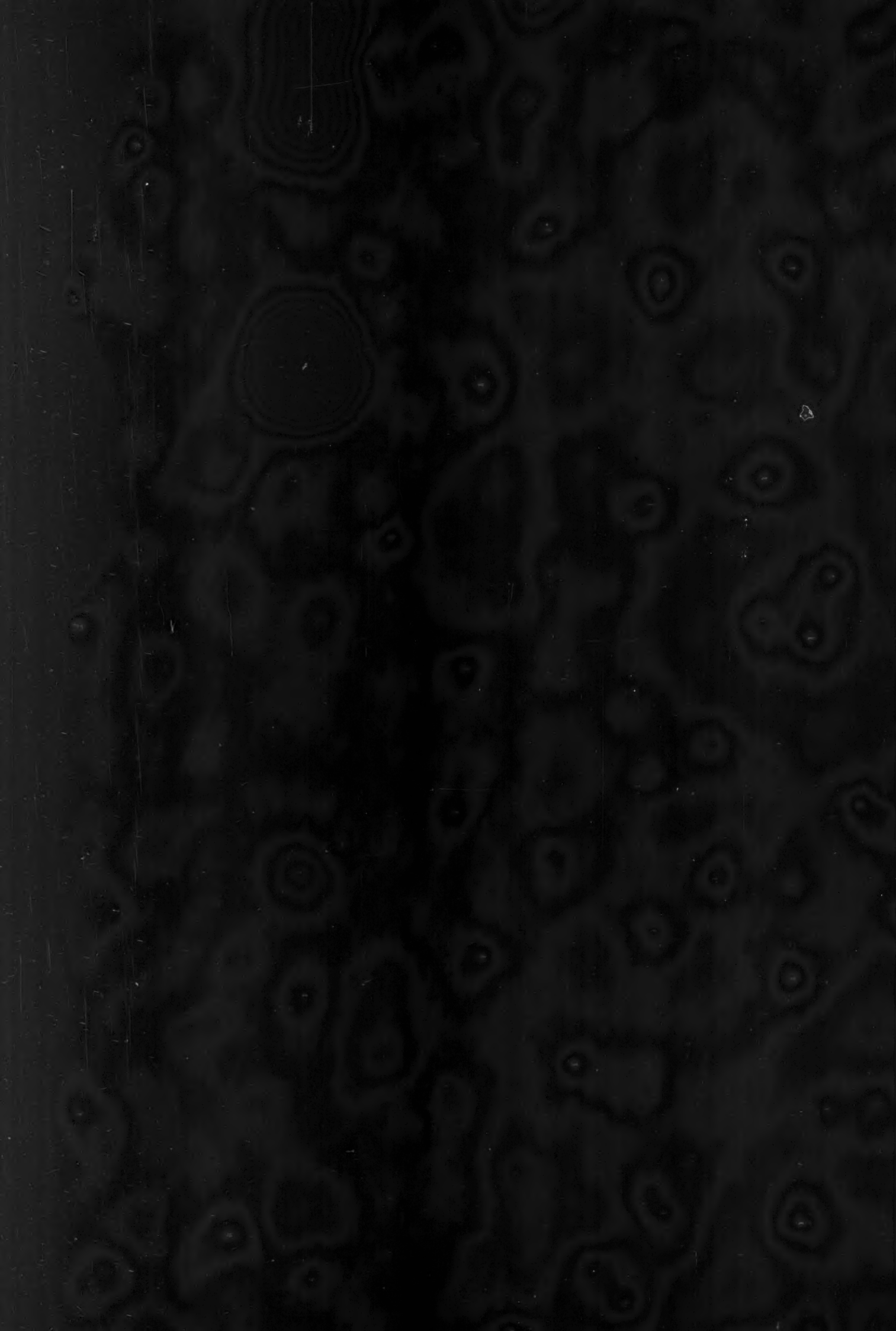
Appliance customers should be given one of the little 4-page leaflets like that at the right. It's a good hint when wrapped up with a package or mailed with a letter or a bill. It tells that to get good results from their lighting and appliances more wiring is needed too.

EVERYONE who works in this business has a stake in more adequate wiring. Little pay envelope stuffers like these at the right tell the self-interest that anyone who earns a nickel from electricity has in wiring. When everybody talks it, there will be ACTION

ADEQUATE WIRING SERVES AND SAVES

A good trade-mark, the experience of many successful concerns proves, helps to drive an idea home. This emblem for Adequate Wiring is beginning to appear everywhere. Do your part and display it too.

—and How



Thomson; range — A. G. Meekison, chairman; H. Rees, C. L. Moffatt, H. K. Crandall and J. Drain; laundry equipment—Drain, chairman; A. Aiken, G. Clarke, E. A. Fairfield and G. L. Watts. The central committee, known as the Home Appliance Council, comprises the committee chairmen, and H. C. Darroch, H. Merilees, M. D. Brooks, R. G. Wallace, H. R. Stewart and G. N. Gardiner, chairman.

Shasta Sales

$30,000 worth of ranges and water heaters arrive at Redding

Construction of Shasta Dam, near Redding, Calif., means more than the ultimate development of 350,000 kw. It also means prosperity for appliance dealers in that vicinity.

One dealer, Roy Brown, has already cashed in. Sold through him to Pacific Constructors, Inc., Shasta Dam contractor, were $20,000 worth of Hotpoint ranges and water heaters. Included were 131 ranges and heaters to be used in the 131 homes now being built for the executive group at the camp. These represent a connected load of 1,510 kw. and an average annual consumption of 409,375 kw.-hr.

Brown also received shipment on an additional $10,000 of equipment which he expects to sell to the contractor's employees.

To make sure that the camp workers will know how to operate the ranges and so become enthusiastic boosters, Edison General Electric Appliance Co. sent Miss Alice Robertson to Redding to hold a cooking school.

All persons interested in the transaction turned out on the arrival of the merchandise. They included Roy Brown; Carl Hagstrom, San Francisco Hotpoint factory representative; G. R. Milford, division manager of Pacific Gas and Electric Co.; B. A. Mason, local agent of P.G.&E.; D. S. Aiken, division sales manager of P.G.&E., and Clye Allen, manager of Electric Kitchen Appliance Co., San Francisco distributor of Hotpoint appliances.

Lamp Fitting

Atmosphere, quiet and a light meter build sales

When you buy a lamp in the Broadway Department Store, Los Angeles, you do not merely select a lamp on the big sales floor. The lamp is fitted to your needs in just about the same way spectacles or clothes are fitted.

Entering the lamp-fitting department, you are given a chair at a table in a small room. There is a light meter on the table. Normally there are about four lamps in the room, two floor lamps and two table lamps. The thought in keeping the number down is to avoid the confusion sure to result from a large number. You can make up your mind much more quickly in the quiet of this room with only a few models to look at at one time.

The sales person describes the use of the meter, demonstrates the nature of the light diffusion by moving the meter from place to place and shows you that you may easily be mistaken as to the amount of light a lamp is throwing on a printed page or about the room.

The results from a sales angle have been most encouraging, according to A. H. Randall, buyer for the department. The time required to complete a sale has been cut almost in two. The customers have on the whole been more completely satisfied with their purchases.

The fact that the room gives a setting similar to a home setting and segregates the buyer from traffic and the confusion of other voices is also considered advantageous.

"However," says Randall, "we are trying to do more than merely sell lamps. We are trying to sell eye comfort. We have in mind the utility of the thing we sell as well as its decorative and artistic effect. A lamp-fitting room like ours costs little, since it is only 10x12 ft. Both furniture and lamps are gathered from departments throughout the store and are always for sale. As a matter of fact, the room sells its furniture in addition to the lamps. This is the kind of service that we feel lamp-buying customers are entitled to. We sometimes wonder how we sold lamps before we put in our department."

Maps & China

Two unusual merchandising tricks bring large results

Maps of various cities, states or sections of country decorate the walls of many businesses. Almost invariably they are used to show in which places specific goods are selling best and worst.

A Victoria, B. C., appliance store—MacDonald Electric, Ltd. — has improved on this map usage. True, MacDonald's map of Victoria serves to show what appliances are selling best in each section of the city and to enable the salesmen to see what progress is being made by each other. But MacDonald's has also discovered another use of equal importance.

When a customer visits the store to buy a range, she is shown the map on which every range (also refrigerator, washer, etc.) user is indicated. Thus the prospect can see that her two next-door neighbors also own ranges. This develops confidence and aids in closing a sale, partly because it promotes her desire to keep up with the Joneses and partly because it creates a sense of security in that it proves that people she knows have already bought a range.

Such ingenuity characterizes MacDonald Electric's merchandising. Consider another stunt:

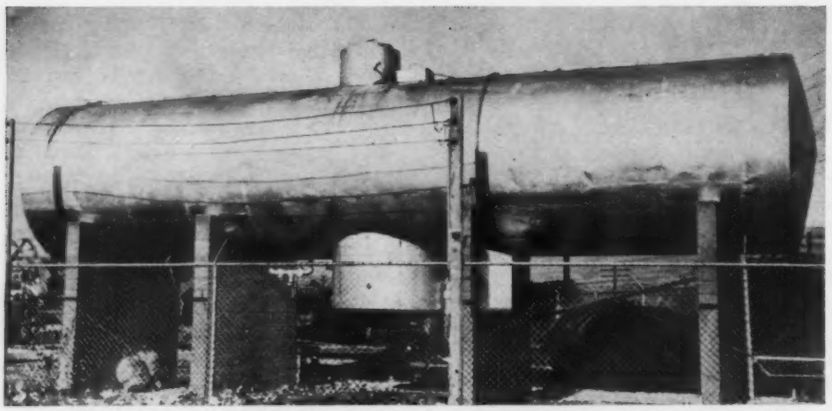
During the past year, the store made a special feature of washers. Two members of the sales staff alone sold 63 washers in 45 days. Such a record was due in large measure to George MacDonald, head of the firm.

"Fitting" a lamp in the Broadway Department Store, Los Angeles

MacDonald found that the store was frequented by many people desiring fuses, switches and other odds and ends but nothing of greater importance. It was clear that they were already acquainted with the store, but the firm had little close contact with them since they were paying cash. The solution appeared to lie in getting as many people as possible on the books.

This was done in an unusual fashion: the store offered an imported English set of dinner china. This set could not be bought for cash. It was only available on terms of 50c down and 50c per week.

Over 1,000 sets were sold. Which meant that 1,000 customers were added to the firm's books and came into the store every week to meet their small



The inverted tank car in which Puget Power installed electric heating equipment

payments (too small to settle by check through the mail). Their repeated visits made them familiar with the store and its staff; it provided an opportunity for sales approach; it broke down sales resistance through the customers' knowledge that their credit was good; and it set up the argument that a small additional sum each week would make them owners of a washer, etc.

All these points together boosted business and led to the establishment of a new record for appliance sales.

Industrial Sales

How Puget Power speeded the operations of road-builders

By M. A. FOSTER

Electricity—in the form of Puget Sound Power & Light Co.—has come to the aid of the Washington State Highway Dept. at Wenatchee. In so doing, it has opened up a wealth of industrial sales possibilities.

The Washington department's need of assistance was obvious. Because the storage tank in which it kept its MC-2 asphalt road material was uninsulated, the material soon became exceedingly viscous. This meant that many valuable man-hours were lost in trying to load the small, highway-patching truck used for distributing the oil.

Something had to be done. So the department began to study plans for installing a steam boiler for maintaining the oil's temperature. This appeared to be a logical change. When originally set up, the storage tank, a 10,000-gal. railway tank car inverted and mounted on concrete footings, had been equipped with steam coils for this very purpose.

Puget Sound Power & Light had different ideas, however. Its industrial salesmen knew that steam-boiler operation had many disadvantages, while electric heat had many advantages. Calculations showed that with adequate insulation 3 to 5 kw., depending on outside temperatures, would be sufficient to maintain a 160-deg. tank temperature during the oiling season. And with thermostatic control, the necessity for attendance would be eliminated. Thus operating and maintenance costs would be greatly reduced.

The highway department required no more proof. It authorized Puget Power to go ahead.

Tank insulation consists of 3 in. of rockwool protected by a weatherproof sheet-metal cover supported from the tank by wood spacers. Every effort was made to install this insulation effectively so that the heat loss would be kept close to 0.1 B.t.u. per sq.ft. per deg. temperature difference.

Because of their successful performance in other oil-heating applications, two 5-kw., 208-volt, straight, tubular heating elements were chosen. Only one of these was actually necessary, because the oil, when delivered to the tank, is preheated to 150 to 200 deg. F. However, a spare was installed so that if heating should be discontinued for a while, reheating could be accomplished with reasonable speed.

The elements themselves are essentially air heaters and consist of a metal backbone on which are mounted cylindrical insulators for suspending and separating the coiled heating wire. They are installed in 2½-in. pipe housings suspended from the top of the tank. (The large area of these housings keeps heat-density low, thus making this type of element especially adaptable to viscous oils.) Maintenance costs are kept down because the elements can be readily removed for inspection and because replacement of coils is inexpensive.

The elements are side by side and extend downward from the terminal box atop the tank to the bottom of the sump. Heating is confined to the lower 5-ft.

A bulb-and-tube thermostat controls the heating. The contactor is in the terminal box, and a ¾-in. pipe carries bulb and tube down to a point near the bottom of the tank. Control wires from the contactor connect with a magnetic contactor switch mounted with the fused disconnect switch on one of the concrete footings.

Several months' operation has verified the accuracy of Puget Power's original recommendations and demonstrated the success of electric heating for this kind of work. One 5-kw. element operated from 12 to 15 hr. daily during the summer, 20 hr. daily during the late fall. Loading time, which formerly took from 1 to 3 hr., has been reduced to only a few minutes. Maintenance schedules have been so greatly improved that the oiling crew is now out on the job for a full day.

Furthermore, the "borrowing" of 1,000-gal. lots of oil to finish out major oiling jobs has been made easier. Originally, unloading of this amount would have taken a long time and cost correspondingly more.

Possibilities of off-peak operation of such equipment are apparent. A prospect whose day-to-night use varies by 10 kw. (only 5 kw. in summer) might install a similar oil-heater on an off-peak basis without increasing his demand. Applications elsewhere may require a change in the size and shape of the tank to meet individual needs. It is believed, however, that no difficulty will be experienced in applying the same principles as those which have proved so successful at Wenatchee.

Future Campaigns

What twelve organizations have planned for coming months

Following utility-dealer campaigns and special events have been scheduled for the next several months:

Denver Electrical League—January, campaigns on IES lamps and lighting, electric cookery and commercial lighting.

LaVeta (Colo.) Light, Heat & Power Co.—January, clean-up sale; stock reducing.

Los Angeles Bureau of Power & Light—February, water-heating campaign.

Mesilla Valley Electric Co., Las Cruces, N. M.—January and February, clearance sale.

Montana Power Co.—March, laundry campaign. Inasmuch as the company does not sell laundry equipment, it will devote itself strictly to advertising for the dealers.

Nevada-California Electric Corp.—February, washer and ironer campaign. March, range campaign.

Portland General Electric Co.—February and March, water-heating campaign.

Public Service Co. of Colo.—January and February, campaigns on IES lamps, washers, ironers, vacuum sweepers.

San Diego Bureau of Radio & Electrical Appliances — January and February, cam-

paign on small appliances.

Southern Colorado Power Co.—February, water-heater campaign. March, campaigns on water heaters and refrigerators.

Southwestern Public Service Co.—January and February, campaign on indirect lighting for homes and displays.

Utah Power & Light Co.—February, campaigns on radio and sunlamps. March, campaigns on ironers, washers and space heaters.

Sales Shorts

Potatoes; contest; economy heat; washer sales; etc.

THE FAMOUS IDAHO potato got its share of publicity Dec. 5, when Idaho Power Co. ran in *Time* an institutional advertisement entitled, "Idaho, the 'Potato Spot' of the Nation." The copy, directed at restaurant chefs and housewives, made no reference to power. Only the signature — "Idaho Power Company, Serving the 'Potato Spot' of the Nation"—gave the identity of the advertiser. Timed to break in the middle of "national potato week," the ad was supplemented throughout the utility's territory by window displays in company stores.

ALBUQUERQUE GAS & ELECTRIC CO. recently conducted a lighting contest for boys and girls under 18 yr. In advertising the contest, the company showed pictures of a living room, bedroom and kitchen and, in another part of the ad, pictures of 28 lighting fixtures. Children were to designate the places in the rooms where the lights should be used. Selling job for better light was incorporated in the suggestions about working out the problem. First prize for the best arranged rooms was $50.

●

ADVANTAGES of electric heat recently came in for a four-page, two-color promotion effort by Pacific Gas and Electric Co. The advertisement, printed on news sheet and headed, "110,000 Acclaim Economy Heat," was distributed house-to-house.

●

FOR THE SIXTH SUCCESSIVE year washer sales in 1938 ran above the 1,000,000 mark. According to the American Washer & Ironer Manufacturers' Assn., 77% of the washers retailed at $50 or more. Expected sale in 1939 is 2,000,000.

TO PROMOTE the Bendix laundry, K. O. Stout, Sacramento appliance store, advertised, "Let us do your next week's laundry free. Just bundle up your laundry and bring it along, or telephone and we'll send a car for you. We would like to have you set the two simple controls of the Bendix, then, if you care to, go on about your shopping." Advertising the Norge range, Stout made a somewhat similar offer: After checking the value of the Norge, "then shop elsewhere . . . compare any other range with the similar model of this Norge. If you buy any other range within 10 days we will pay you $5 in cash."

●

LOS ANGELES FURNITURE MART will hold its ninth semi-annual Market Week, Jan. 23-28.

●

TO CLEAR OUT their 1938 stock of ranges, Los Angeles dealers last month advertised that they would give away free with every range purchased a 1939 Packard-Bell Kompak radio and an eight-piece set of Wear-Ever kitchen utensils valued at $14.25.

APPLIANCE SALES REPORT---NOVEMBER 1938

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1]		L. A. Bureau of P. & Lt.[2]		Montana Power Co.[3]		P. G. & E. Co.[4]		San Diego Cons. G. & E. Corp.[5]		San Joaquin Lt. & P. Corp.[6]		Southern Calif. Edison Co., Ltd.[7]		Utah Power & Lt. Co.[8]		Wash. Water Power Co.[9]	
	Current	11 Mos.	†Current	†10Mos.	†Current	†11Mos.	*Current	*10Mos.	Current	11 Mos.	Current	11 Mos.	†Current	†10Mos.	Current	11 Mos	Current	†10 Mos.
Ranges	390	4207	451	3986			362	3388	60	538	112	1311	248	2554	210	2645	173	1970
Water Heaters	157	1966	126	1225			265	2153	60	520	65	641	91	981	24	744	136	1434
Air Heaters, aux.	142	450	290	841			899	4026	450	1395	122	317	221	1081	190	804	185	722
Air Heaters, 220			65	380			145	725			48	367						
Refrigerators	132	3961	1930	27356			2758	35796	500	7275	121	4620	2056	30167	234	7183	235	6058
Dishwashers	1	22	7	204			76	182			4	58				39	2	7
Washers	319	3389	1823	16677			3428	24495	375	3835	182	2792	2438	21232	814	7925	537	4326
Ironers	32	362	387	3279			709	4637	65	635	28	631	316	2809	66	511	31	301
Vacuum Cleaners	92	838	510	5104			2327	20078	225	2480	68	868	965	8869	246	3528	274	1962
Radios	915	6431	3237	27953			14395	86265	1250	10775	439	4990	5116	40161	2023	13426	1989	11390
Mixers	47	468	176	1626			312	3138	200	1470	39	449	230	2288	101	1451	132	1440
Cookers, Casseroles	21	232	99	854					100	845	30	482	70	731	71	827	330	4220
Irons	387	3983	707	6175					500	5150	221	3204	1002	9882	899	10080	853	6910
Waffle Irons	92	1004	279	2239					175	1800	87	836	292	3073	291	2875	255	1800
Toasters	211	1547							400	3750	119	1339	480	4522	339	3705	535	3818
Table Stoves	174	1756	259	1811					85	910	72	904	194	2408	399	6674	131	1562
Heating Pads	103	478	170	1092					200	1205	70	390	144	1426	262	1736	146	1090
Curling Irons													35	368	119	1746		
Coffee Makers	171	1613	126	889					450	3940	108	1228	253	2911	349	3748	625	4208
Sewing Machines	9	184					599	4626	135	1000					153	1653	59	615
Clocks	108	874	305	2240					425	3700	152	1489	502	4761	284	2608	349	2339
Fans	6	1103	24	1192							20	1636	133	2360	11	1028	30	2963
Floor Polishers																		
Sun Lamps	18	89											29	243	4	74	15	60
Reflector Lamps	490	2974									225	1760			1241	7569	1679	10242
Miscellaneous Lamps	635	3399													823	6683	865	7352
Yard Lights											63	579						
Misc. Small Appl.			215	2379					525	6050	82	1011	543	5899				

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Compiled by Los Angeles Bureau of Power and Light for territory served by that system.

[3] Combined dealer and company sales from report of Montana Power Co. ‡ Does not include dealer figures for two divisions for January and February, 1938.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. *Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures includes fans, curling irons and sun lamps.

[6] Includes dealer reports from Midland Counties Public Service Corporation also. Compiled by Valley Electrical Supply Company.

[7] Includes reports from dealers on San Joaqin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

[9] Dealer sales only for Spokane and company territory. Company sales not included. Table stoves, grills included with cookers.

† November figures were not available at time of going to press.

ELECTRICAL WEST

The All-Industry Magazine of Progress

Established 1887 and Incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity"

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Property Rights Be Damned

AMONG the things guaranteed to every American by the Constitution is sanctity of property rights. The manner in which these rights are being flaunted, ignored and violated in the government's power dealings in the TVA, in Texas and in other sections of the country should be a matter of serious concern to every American citizen. For the government to sanction and condone tactics that it would immediately condemn if they were practiced by others is to sidestep safeguards which have been fundamental principles of our system of government.

When a governmental agency uses federal funds and federal prestige to destroy the value of privately owned power companies simply because that agency refuses to pay a fair price for these properties, it is time for the public to call a halt. This is exactly what is being done in many communities where government funds are being used to build competing electric systems. Such "knock-out" tactics are being violently condemned by Americans because they are happening in other countries. Yet the principles involved are the same.

We have courts and public service commissions for the purpose of determining a fair value of a utility system in cases where it is impossible to agree upon a purchase price. To continue to force the sale of such properties through subsidized competition is both a threat to the rights guaranteed under the Constitution and a blow at continued prosperity. So long as such tactics continue potential investors will pass up the utilities and a great amount of new construction and new business will be held back from the stream that should be building up national prosperity.

Not Price Alone

CHIEF complaint lodged against the big chain merchandising organizations—the mail order houses who now have so many branch stores—is the low price at which they sell competitive lines. But the secret of their sales volume is not price alone. Without that sales volume, of course, they could not sell at such low prices.

The volume does not come to them automatically with the low price, however. It still takes extensive advertising and it takes a high grade of salesmanship. And these chain organizations, experience in the electrical appliance field reveals every day, are passing no opportunities offered them to improve their selling methods.

It is not uncommon to see reports in utility house organs of this kind: "Montgomery Ward & Co. called on the sales and home service departments for a series of schools this month. The first in the series was a talk on rates . . . . . " Queries among dealers as to whether they use the Appliance Sales Guide published in this magazine often show indifference among those dealers who complain most of the chain stores' selling methods, and enthusiasm among the alert sales crews of the chain organizations. They are eager for the short cuts, the aids, the sales helps that are available to all dealers alike but which so few of them use.

When complaints from less successful generals reached President Lincoln that General Grant drank whiskey, so the story goes, the wise chief executive asked them to find out what brand Grant used so that he could send some to his other generals. Dealers worried over the volume the chains sell would do well to study their complete sales technique, not price alone.

Shift in High Gear

ONE OF the foremost economists of the country says that "if we were ever certain of anything in our lives, we are certain that business will be good at least for the next six months." And he cites seven great forces which are pushing business up and up. All of which leads to some observations:

The businesses which make the most of this opportunity will be those which sell harder, more aggressively and with more speed than they ever

have before. In this seeming new era trends have proved to be fast moving. The recent downward cycle traveled at four times the speed of the 1931-33 depression. The recovery will be equally fast. Hence there will be little time for the leisurely decisions of the past. Along with this is the necessity for greater efficiency to meet the higher taxes and still keep prices reasonable. There is a sales opportunity ahead for the electrical industry, but it must be geared up to meet it.

1939—Still Competitive

IN addressing his sales crews, the practical and successful president of a distributing organization struck a keynote that may well be taken as the challenge of 1939 to anyone in the electrical industry.

"It will be a mistake if any of you get the idea that you can just take this business in stride. This is still a highly competitive business, a game, and you have to be more alert and energetic to make a success of it than any football squad you ever saw."

The electrical business is still competitive, a game, in spite of any other more seductive philosophy that by making electricity abundant the public will avail itself of it more freely. There are too many substitutes, too many enticing appeals for the customer's dollar outside of electrical usage, to let any such drug lull those engaged in this business into inaction and a siesta.

Since the game must still be played hard to win, what does 1939 look like?

It looks like a good year if we choose to make it such. Before 1938 had wound up, the power production records of past years had been broken with new highs, both nationally and especially in the West. Building of small homes during the last months of 1938 began to increase with some of the long-predicted volume, and there are signs that even more punch is to be put into home-building in 1939. This building is likely to reflect itself in more commercial and industrial building as it always has in past cycles. Ship-building and rearmament activity contemplated by the government is already making itself felt in coast cities.

Every distributor of major appliances is holding back news of big changes in refrigerators, washing machines, ranges and other appliances that are designed to make buyers want to exchange old for new equipment. The long-heralded television will probably be launched in 1939.

As for government and taxes, they can be expected to be what they have always been—costly and annoying. But the administration seems to have found some new scapegoats on which to pin the ills of mankind and the power industry may have a chance to go to work again. If it does, there is a big backlog of line rebuilding and plant replacement to be done. The new peaks have literally put "the heat" on present capacity and equipment.

As for Europe and the Orient, whose wars and threats of wars have had all on the anxious seat during 1938, the probability that the long-expected flame will finally kindle is as good as it was a year ago. On the other hand, with each nation arming to the teeth, the temptation to knock the deciding chip off a shoulder may grow less grave.

As realists, this industry, chastened by the scourges of the past few years, looks toward 1939 with a tightened jaw. It will be as good a year as we can make it.

Frank Griffith—First Citizen

IN these days when so many of the deeds and policies of our industrial leaders are subjected to attack, criticism and suspicion, it is refreshing to find a community which recognizes and acclaims the public service of such a great and good man as Franklin T. Griffith, president of Portland General Electric Co. His selection as First Citizen of Portland for 1938 is deserved recognition for unselfish and courageous contributions to the welfare of his community. The electrical industry, in which he too has been an inspiring leader, will acclaim this selection.

His friends and associates in the industry can add their approbation and approval to such statements as these from the citizens of the group that made the selection:

"Frank Griffith is eloquent living proof that a big business man can be a blessing rather than a curse to his home community, that it is no crime to be highly successful, and furthermore, that a man can be a gentleman of charm and dignity and still get along with thousands of employees on a friendly cooperative man-to-man basis . . . . . He takes the broad constructive position that the Bonneville project can be of great assistance to this community, his only reservation being that he does not want the Bonneville Administration to put entirely out of business the company he has worked so long and so hard to build up and to protect. Even those who may differ with him in matters of policy credit him with conscientious motives and respect him for the pardonable loyalty he feels toward his thousands of stockholders."

Of Mr. Griffith's personal fight and sacrifices to preserve his company in the face of almost certain bankruptcy, our industry knows full well. And it knows many sidelights to his career which add to the above list of accomplishments.

Like the committee who selected him as first citizen for 1938 we can say that here is a type of man to be emulated by those whose achievements in our great industry are in front of them.

Through the Wrong End of the Telescope

Too much of our effort is to raise the adequacy of an already finished wiring system. Why not try some preventative medicine?

WHY not remove that familiar obstacle, inadequate wiring, at its very source? Why not devise a way to equip a house with 100% potential electrical use at the very outset at little added cost? Not just the Red Seal or certified Adequate Wiring plans, but a service sufficient to provide for anything—even complete electric heating—that might be wanted at some time in the future?

In tackling the wiring problem, has the industry gone far enough? When starting an installation, why shouldn't we sell, in a standard packaged outfit, service-entrance equipment capable of supplying the needs of a house during its entire life?

These questions have run through my mind, first when I was a contractor, later when I held classes for a group of architects and now that I am an engineering salesman for electric heating. Too much of our effort is to raise the adequacy of an already finished wiring system after the horse is stolen. Why not try some preventative medicine?

If we could sell 100% service at the time a house is built, these benefits would accrue to the industry:

(1) We could permanently remove the obstacle of wiring inadequacy.

(2) It would permit an "installed" price on heavy-duty appliances that would be fair to the contractor. It would be simple to estimate this installation cost, because it would be a matter merely of measuring the number of feet from the service to the appliance and because there would be no need of considering a new service.

(3) It would increase the market for every use of electricity.

(4) Service calls and trouble calls resulting from fuse burn-outs or inefficiently operating appliances would be reduced.

(5) We could give the customer a full dollar's worth of service for his electric dollar.

(6) We could remove the cost bugaboo from appliances and thus stimulate their sale.

Prompted by the belief that every 30-amp. residential service installed practically destroys a considerable future market for heavy-duty appliances, I decided to collect and analyze statistics bearing on the problem.

The first step was to assemble the following facts and figures: (1) The Los Angeles County building department reported that for the 1937 fiscal year it issued a total of 5,617 residential permits in the unincorporated county area. Of this number, 64% had 30-amp. services; 32% had 60-amp. services, and the balance had 100-amp. or larger. (2) Southern California Edison Co. reported that for the same year it connected some 20,000 new residential customers throughout its entire system, which covers numerous incorporated cities.

Taking the county statistics as a guide, but allowing for a somewhat higher class of construction in urban areas, I assumed that 50 instead of 64% of the total services connected would be 30 amp., and 25 instead of 32% would be 60 amp.

This being conceded, there were installed in 1937 on Edison lines alone 10,000 30-amp. services and 2,500 60-amp. services. In other words, at the present rate of building, there are each year 10,000 new homes completely eliminated from the heavy-duty appliance prospect list and another 2,500 placed in the "limited service" category.

Now what has the industry been doing to improve this situation?

Adequate wiring and campaigns for selling it to the public have been with us in one form or another for a great many years. The Red Seal Plan has met with large success. Architects and the public are thoroughly sold on the idea of more and more light and convenience outlets and more and better-located local switches. Yet, after ten years, we find that at least 50% of the new services installed are 30 amp. and 75% are 60 amp. and less.

The obvious conclusion is that we have been looking through the wrong end of the telescope. Our attention has been focused so intently on selling outlets and convenience—and a growing appreciation of electric service in general—that we have to a large extent overlooked the all-important need of backing these outlets and this appreciation with adequate service facilities. The average home owner who has invested in a Red Seal wiring job, and who after a few years decides to go "all-electric," is shocked to learn that his service facilities are inadequate. Somehow he got the idea that that big 100-amp. switch would take care of his most extravagant requirements for all time to come. Rather than replace his old equipment at considerable expense, he will probably postpone the increased use of electric service indefinitely.

The foregoing facts and figures, together with those following, form the basis for my arguments in favor of a "standardized" service permitting 100% electrification of the residence in which it is installed.

All calculations for switch, wire and panel-board sizes are based on the provisions of Los Angeles County Ordinance No. 2252-New Series. Metering layouts comply with the Edison company's rules.

Only one-story residences up to 2,200 sq. ft. of floor area have been considered. These have been divided into three groups: Group I—up to 600 sq. ft.; Group II—600 to 1,500 sq. ft.; Group III—1,500 to 2,200 sq. ft.

Standardized service No. 1, as outlined below, is designed to provide 100% electrification of residences in Group I. No. 2 service will care for Group II. No. 3, for Group III.

The typical house in Group I, adequately wired as regards branch circuits, will contain eight convenience outlets, ten light outlets and the usual complement of switches. Service required will consist of three No. 8's in ¾-in. conduit, a Type S meter socket and an all-in-four panel. This equipment (with proper ground) can be installed and sold to the customer at an average price of $20. This carries a markup of 30% on prime cost. Besides the two circuits in use, it provides a transformer circuit and one spare circuit for a 1,500-watt future load.

By taking advantage of Section 2351a of the 1937 Code, you could install standardized service No. 1 to serve this group. This would consist of two No. 1 and one No. 4 RC conductors in 1½-in. conduit; a Type S meter socket; a flush, indoor circuit-breaker-type load center 9x11 in. in diameter and containing two 50-amp.

By C. A. Rowley

double-pole breakers, and a 25-amp. DP breaker. Nippled to this would be a ten-circuit flush panelette. No main switch would be required.

Such a service layout will accommodate the four original circuits and provide six spare circuits sufficient for completing room heating. One 50-amp. breaker will serve the panel; one is held in reserve for a future range, and the 25-amp. breaker will serve a future water heater. This reserve capacity is made available for future extension by stubbing an empty 1-in. conduit and an empty ¾-in. conduit from breaker panel to below the floor level and two empty ¾-in. conduits from the fuse panel to the same location.

All the above equipment installed complete can be sold for about $57. The difference in first cost, therefore, between the totally inadequate service and the 100% adequate service is $37.

Even as a lump sum this amount does not form a very big selling job. Spread over the usual 20-yr. payment period allowed by FHA, it is, indeed, small as compared to its potential value.

Analyzing the situation, we find the following potential sales destroyed for lack of this $37 investment: One range ($125); one water heater ($80); four room heaters ($175); extra wiring ($60)—total ($440 per house). And the following potential kw.-hr. sales are destroyed annually: Range (1,200 kw.-hr.); water heater (3,600); room heaters (2,500). At 1c per kw.-hr., this potential loss amounts to $73 per house.

Now if we apply these unit quantities to the 10,000 minimum services installed annually on the Edison system, we get the following amounts representing the total potential business destroyed because of inadequate service facilities:

Services—$37 x 10,000 = $370,000.

Merchandise—$440 x 10,000 = $4,400,000.

Central station service (annual)—$73 x 10,000 = $730,000.

The grand total is $5,500,000. And even if we discount this amount 50 or even 75% (because, after all, no one expects a 100% selling job), we still have quite a respectable total.

The difference in the selling value of ordinary and standardized services for Group II houses is $45. Group III requires the use of current coils and transformer cabinet, which jumps the difference to about $64.

(For diagrams of the three proposed standardized services, see Figs. 1, 2 and 3.)

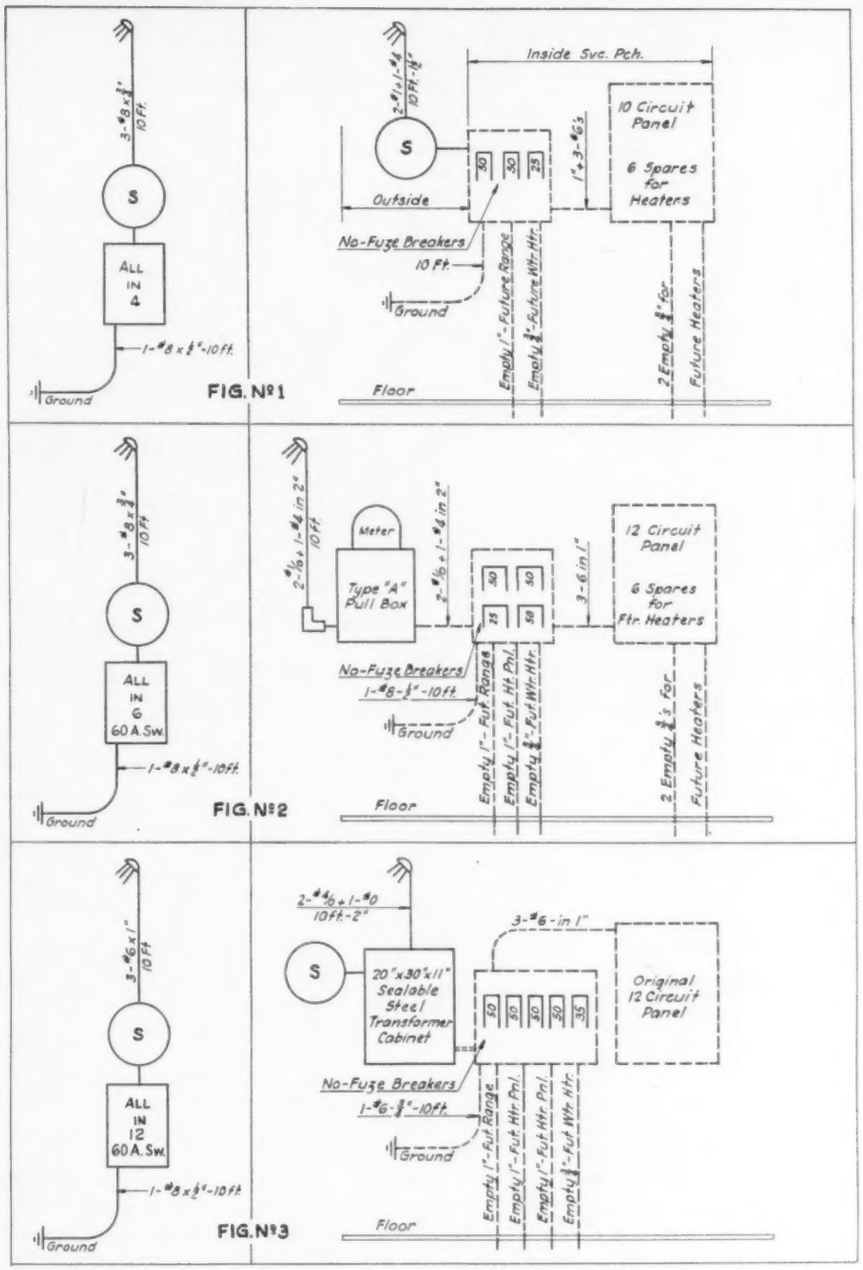


Fig. 1—(Left) Typical 30-amp. service, of which 10,000 or more were installed on Southern California Edison lines during 1937. Approximate selling value: $20. (Right) Proposed "standardized" service No. 1 for residences under 600 sq. ft. Selling value: $57. Fig. 2—(Left) Typical 60-amp. service found in thousands of residences of 600 to 1,500 sq. ft. floor area. Selling value: $28. (Right) Proposed "standardized" service No. 2. Selling value: $73. Fig. 3—(Left) Typical 60-amp., 12-circuit service found in many residences of 1,500 to 2,200 sq. ft. Selling value: $45. (Right) Proposed "standardized" service No. 3. Selling value: $110

Potential sales and revenue per house of Group II are: Service—$45; merchandise—$730; annual revenue—$113. The importance of these figures is obvious when you consider that of the 20,000 homes per year, 5,000 to 6,000 fall in this class.

Further figures for Group III are purposely omitted, but the possibilities are relatively the same.

All this does not, of course, serve as a finished plan. Instead, it is the presentation of an idea. If thought feasible, it should be studied by a committee competent to set up standards and outline a sales plan that will supplement rather than conflict with existing Red Seal and Adequate Wiring plans. Properly promoted "standardized" residential services should prove a very valuable selling tool in the hands of the electrical industry.

Dear Bill,

A Letter From a Contractor to a Homebuilder

I HAVE checked over your house plans and figure that you should be able to get your electric work for $110 to $125.

I have naturally been interested in your plan for a new home on account of our long acquaintance. I think you have a nice arrangement and should be very comfortable when you occupy same for your permanent residence.

It is only with my friends that I take the liberty of bringing to their attention the rapid strides being made in our industry for more conveniences and comfort and for labor-saving electric devices for use in the home.

Naturally, the barest requirements of your specifications and plans and the local ordinances will decide the cost of your wiring job when in competition. The same competition will give you a whole lot more for the money, than you have asked for, if you know how to ask for more of it in your specifications first. Once you award the contract, any of these will become extras and you may pay more in proportion than you should.

The use of electricity is accepted and given no more thought than the rising sun of the morrow. The regrettable part of this story is realized when you move in and have no place to use properly the electric gadgets your friends give you, or those things you and the Mrs. decide would be easier on your nervous system even if you have to buy them on a time-payment plan.

It is unfortunate that wiring contractors have no means for financing a time-payment plan to assist you in obtaining added comforts through an 'Adequately Wired Home.' There is no set-up in our industry, such as we find in the sale of refrigerators or automobiles. Most of the wiring contractors interested in wiring your home are a struggling, highly technical group with no time, patience or facilities for writing a personal letter to you such as this.

I am offering the following suggestions for your thought and study.

(1) It is essential that your specifications include a clause for the installation of door-bells, buttons, transformer. The latest thing is the use of chimes.

(2) It is essential that your plug receptacles be of a better grade than ordinarily found in the five and dime stores. Therefore, a specific catalog number calls for an expense of only $4.50 more to give you secure contacts and eliminate radio interference. One replacement cost later will require this expenditure if the receptacles are not durable.

(3) How about a radio plug? The wiring should be concealed in the building and the receptacles placed where they would be convenient to your set.

(4) I have done some of your motor repair work in your plant and sometimes we give as a Christmas present such things as electric clocks or other appliances. Where would you connect such a gift? I think a plug over your fireplace in the living room and one over the door in the kitchen would look much better than a lot of cord hanging around to supply this clock.

(5) Talking about the kitchen: Just the other day I read in the paper that the power companies are being encouraged by the government to spend over $2,000,000,000 to improve their power plants. This means cheaper rates and more and more use of electricity. While you are building you should put in the proper size wire and conduit for an electric stove in your kitchen. This means that the service conduit should be at least 1¼ in., the wires three No. 3 and the metering equipment large enough so that you will not have to change it later on. One-in. conduit and three No. 6 to the kitchen will suffice.

(6) The washing machine, the ironer, the refrigerator—in fact, all the plugs in the kitchen and back porch should be on a separate circuit of No. 12 wire, if you don't want to spend a lot of money for electricity that you won't get. Nearly all of our electric appliances and devices are designed to do their work within a certain definite period of time. Some time you wonder why the toaster takes so long to make toast. The manufacturer designed it for a 3-min. operation. If your wiring is not just right, it will take 5 min., and then you are paying for 2 min. of electricity you don't really need.

(8) For those snappy mornings, or when there is sickness, the manufacturers have designed a built-in type of heater for the bathroom so that you won't freeze to death waiting for the whole heating system to start. This is not only convenient on account of the immediate heat, but saves on your whole heating plant operation.

I read that section of your specifications concerning your heating system. I do not know if you are going to insulate your outside walls to curtail excessive heat losses. This is being done in all new homes where people are wise to it. You would not make a mistake by running a separate circuit of No. 12 rubber-covered wire to the location of your heating equipment. Within another two years you will be figuring on air conditioning your home. You will need power as well as insulation. The more insulation you have, the less power and fuel you will use.

As I must close this letter sometime, I will enumerate the following for your consideration. You can scratch off the list the items beyond your means to purchase at this time.

(There follow items covering outdoor lighting, electric heaters, wiring circuits, location of plugs receptacles, etc. Cost of each is included.—EDITOR.)

This additional work will not by any means make a complete electric home. However, the added comfort and convenience will certainly make the end of your business day something to forget when you are able to be home for a rest period.

If I can be of any further assistance to you please feel free to call on me.

Your friend,

JOHN SMITH.

EDITOR'S NOTE: *The following letter was actually written by an electrical contractor to a friend. The mere fact that the names have been changed does not in any way detract from its value. It is a sincere, friendly letter outlining in plain, contractor's language what electrical facilities are necessary for the greatest enjoyment of a home. As a sales letter it is one of the best we have seen. If more electrical men would write more letters like this, the adequate wiring campaign should go forward by leaps and bounds.*

Maintenance

Of electric industrial trucks is an important job. Herewith some pointers on how to do it

BY WILLIAM O. HICKS

Importance of the electric industrial truck to manufacturing and warehousing is proved by the affectionate names —"Mule," "Minnie," etc.—bestowed on it by employees. So great is this importance that any factory man in any way responsible for plant-equipment maintenance should have an acquaintance with the inside workings of the truck.

Although electric industrial trucks are today practically custom-built for each plant, basically they are all composed of certain specific units—the chassis proper, drive unit, hoisting or elevating unit and a common source of power, either storage battery or gas-electric unit. Each of the power units is a simple mechanism consisting of a d.c. motor supplying power through a gear-reduction unit to axle or sprockets; each is a self-contained assembly with its own independent controller or speed and reversing switch.

It should not be necessary to mention the necessity for regular lubrication of such a machine. Yet it is surprising how seldom a definite, regular program of lubrication and maintenance is established and carried out.

Here are a few points which should be remembered:

Gear cases of the driving, hoisting units, etc., require so little attention that they are frequently left to be checked "next time"; consequently the oil level often runs so low that there is unnecessary wear of gears and bearings. A maintenance man should never allow a new truck to be placed into operation without first checking all oil levels. And besides periodically checking oil levels thereafter, he should see that gear cases are drained, flushed and refilled at least once a year.

The universal joints in the driving unit of four-wheel steer trucks are usually grease-packed, and the joint protected from dirt by a flexible leather boot. Every three months, this unit should be jacked up, the wheel removed and the universal joints inspected for wear and well repacked with high-pressure lubricant.

With proper care, roller chains on high-lift trucks should last indefinitely. Chains should be regularly flushed off with kerosene or distillate. Some manufacturers recommend a heavy oil for the chains, but a light, penetrating oil will lubricate the chain rollers—the one essential point—without leaving a heavy, oily coating on which abrasive dirt and grit will accumulate.

Periodic mechanical inspection for wear and play is mandatory. Most broken axles can be traced to wear in the axle guides, play in universal joints and axle splines. Chain adjustments and platform roller settings should be checked to be sure platforms ride evenly without bind in the uprights.

For some reason or other, the electrical equipment of industrial trucks is usually considered as in the mysterious realm of physics. As a result, it is often ignored. Actually the maintenance of the electrical equipment is simple. There are only two parts (aside from source of power)—the motor and the controller—to be considered.

Present-day motors will last indefinitely if the brushes are free in their holders, held against the commutator with proper spring tension and kept free from carbon dust, which causes short circuits. Many expensive motor overhauls could have been eliminated if the covers of the brushes had been removed occasionally, the carbon dust blown out and each brush tested by lifting its spring to be sure it was free in its holder. Because of wear, the brushes become shorter and should be replaced. If they aren't replaced, there will be insufficient pressure and arcing at the commutator will start.

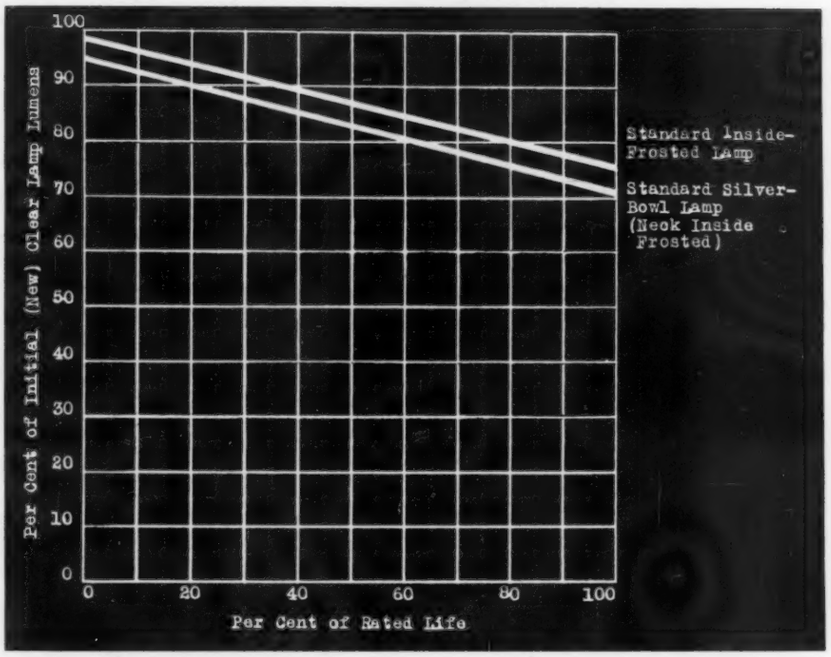
If after long or severe service the commutator becomes worn, it should be removed, turned and the mica properly undercut. When this is done, check the motor bearings for wear.

Industrial truck controllers are constantly being improved; nevertheless, they too demand attention. When caught in time, small pitting of fingers and segments can be removed with fine sand-paper. If not cared for, renewal is necessary.

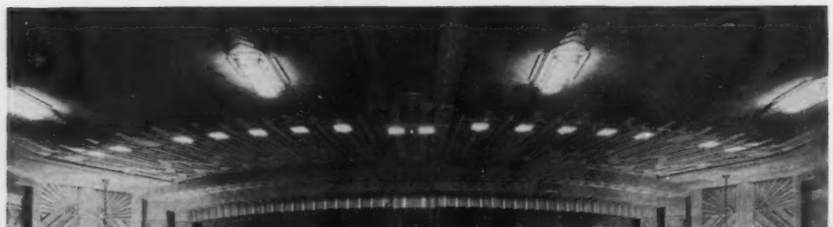
Keep all parts of the controllers clean. Apply only highly refined ignition grease, vaseline or light mineral oil to sliding contact parts. Keep sufficient oil on the surface for proper lubrication, but use sparingly and wipe off any excess.

The setting of controller fingers depends on construction of the controller. Insist that your truck dealer show you the proper adjustment for your truck. And don't forget that there are probably one or two controllers on your truck besides the drive controller.

Silver-Bowl Mazda Lamp Performance Curve



Silver-bowl Mazda lamps, when used in properly designed luminaires, make possible efficient and attractive indirect-lighting installations. As a result, silver-bowl lamps are coming into more widespread use in commercial-lighting practice. Because the Mazda-lamp manufacturer's schedules do not show the performance characteristics of these lamps, however, conflicting statements are frequently made in the field, and considerable uncertainty exists as to what can be expected of silver-bowl lamps under normal operating conditions. In order to furnish authoritative information on this subject, Leo G. Gianini, General Electric illuminating engineer, has drawn up the above performance curves on both the standard silver-bowl lamp (with inside frosted neck) in the 200-500-watt range and the standard inside-frosted lamp. The curves, showing the effect of burning hours on lamp depreciation (excluding effect of dust accumulation) were drawn from data furnished by G. E.'s Nela Park Engineering Department



Looking down from the balcony on to the stage in the auditorium of Ogden's new $1,000,000 school. (For details, see story)

While checking over the other parts of the truck, inspection of the wiring for chafing, corrosion, etc., can be made incidental. But it should be a definite part of the program.

Somewhere on the truck is a resistance grid assembly. See that it is in good condition.

Above all, remember that the electric industrial truck is a husky serviceable piece of equipment. It represents an appreciable investment. Although it will give surprising service even when neglected, it is worthy of regular, periodic and responsible attention and checking over. That is the job of the maintenance man.

$1,000,000 School

Electrical facilities alone justify the Ogden school's nickname

In Ogden, Utah, the new Harrison Avenue High School is popularly referred to as the $1,000,000 school. The nickname is well chosen. A tremendous, modern-Gothic building, the school incorporates every feature conducive to intensive yet easy learning. The electrical facilities form one of the these features.

Costing slightly over $75,000, they were installed by Ogden-Cache Electric Co., an organization composed of the Ogden Electric Co. and the Cache Valley Electric Co., Logan.

Most spectacular part of the installation is in the main auditorium, seating 2,200 persons. Lighting here is by means of semi-exposed Holophane lens units incorporated into the architectural treatment. Illumination is better than 12 ft.-candles throughout, thus permitting use of the auditorium as a study hall.

The proscenium arch in the front of the auditorium was similarly treated (see cut). Directly over the arch are 16 square, recessed lens units arranged in a semi-circle. These are fitted with 300-watt lamps, the lenses concentrating the light on the apron of the stage and orchestra pit. This supplies enough illumination to make a speaker, standing before the dark green curtain, clearly visible from any point in the room. Lighting intensity is about 25-ft.-candles.

On each side of the proscenium arch are two immense lanterns matching the decorative design of the auditorium. These have three 200-watt indirect lighting units in the top to light the ceiling and upper part of the arch, and four 100-watt reflectors in the back to light the wall and side of the arch. All these lamps are screened from the front. Three 50-watt lamps fool spectators into thinking the lanterns are brightly lighted.

Behind the rather dark grille-work above the clock on the left is the public-address and sound-amplifying system. The architectural design is carried to the ceiling, so that the grille would go unnoticed unless called to a person's attention.

Main stage switchboard consists of a stage section with master control and switches, a stage pocket section and a house section with house masters and switches and dimmers for the individual sections. The house master, of the remote-control, contactor type, is controlled from the stage as well as from the projection booth. A double-throw switch permits transferring of control of the proscenium floodlights from the house master to the stage master busses.

Get-Together

Electrical and general contractors unite to stabilize building

Electrical residential contractors of Vancouver, B.C., and builders of private homes have finally got together.

This fact, vital to the British Columbia electrical industry and exemplary to the electrical industry throughout the West, is the result of action taken by speculative contractors who felt the need of an organization to stabilize the construction industry. They achieved their aim with the assistance of the Vancouver Electrical Assn.

Cooperation of the electrical and general contractors does not stop there, however. Members of the electrical association's relations committee have been sitting in and helping at meetings of the Home Builders.

J. S. Homersham, chairman of the VEA relations committee, says the object of the electrical men has been to show the utmost cooperation in the development of the new trade body. At the same time, they aim to build harmonious relationships between the members of the two organizations. Contacts already made have tended to smooth out some misunderstandings which formerly cropped up.

And last, but far from least, is the desire of the electrical men to educate the builders to the value of correct wiring installations in homes destined for sale on the competitive market.

Larger Copper

An NEMA report points the way to an important trend

Larger copper will be required in the future. This can be predicted after study of the published findings of an NEMA committee which spent eight years checking the National Electric Code tables of current-carrying capacities of wires and found that they were not affording the minimum safety factors which good engineering would require.

In these findings, contractors and inspectors can unearth the answer to the question that has often puzzled them: "When wires are pulled out of a con-

duit after long use, why has the insulation gone to pieces? Why does it stick to the conduit?"

First announced at a recent series of inspector conventions, the findings have not yet been considered in relation to future editions of the code, but opinion that they would affect the code's future editions was generally accepted as inevitable. This will mean that larger copper will be necessary to carry the same loads in future installations and that contractors wishing to provide their customers with reserve capacity for the future should take these tables into account.

Entitled "NEMA Report of Determination of Maximum Permissible Current-Carrying Capacity of Code Insulated Wires for Building Purposes," the report covers the following important points:

(1) Maximum operating temperatures of 50 deg. C. for "code" rubber; of 60 deg. C. for "performance" compound; of 75 deg. C. for "heat-resistant" grade. These values are for a 30 deg. C. ambient.

(2) Values of current-carrying capacity in amp. for conductors of sizes 14 awg. to 2,000,000 circ. mils, inclusive, for each of the following conditions of installation: (a) One single-conductor cable installed in one conduit; (b) two single-conductor cables installed in one conduit; (c) three single-conductor cables installed in one conduit; (d) one two-conductor cable installed in one conduit; (2) one three-conductor cable installed in one conduit.

Lighting Shorts

Intersection lighting; stimulation; safety rules; reprint

STREET INTERSECTIONS in downtown Salt Lake City are larger than a baseball diamond. Because of this, street lights on the corners do not illuminate the center of the intersection. H. S. Auerbach, president of the Auerbach department store, met this situation by having installed at the Broadway and State St. intersection opposite his store five sodium vapor lights. These are suspended over the traffic light in the center of the street; they are supplemented by 24 arc lamps on the corners. The installation, made at Auerbach's expense with the approval of the city officials, is said to be the first of its kind in the world.

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B. C. ELECTRIC RAILWAY CO.'s use of a portable lighting outfit and film library is stimulating interest in proper lighting of public buildings throughout the rural area of the lower mainland of British Columbia and even in the suburbs of Vancouver. The film library of the company is well known and many calls are received for presentations. This season, however, the company has worked out a plan of using the portable outfit to light adequately almost all halls and buildings in which the films are shown. Thus many organizations learn just how inadequate existing lighting installations in their clubrooms are.

Every year there is a need of electric service for decorative street lighting. Therefore, why not provide a permanent source of supply? Thus reasoned the City of Oakland. And as a result, Contractor T. L. Rosenberg installed a conduit service from the underground distribution on each side of the main downtown streets. Above is a typical service, with 1½-in. conduit, socket-type meter and weather-proof switch and service head, all permanently fixed to a trolley pole. Last Xmas, as usual, overhead stringers were hung up and down and across the streets. Store owners pay for the lighting on a pro-rata basis

SAFETY RULES for the operation of electrical equipment and lines are incorporated as Part 4 of the fifth edition of the National Electrical Safety Code just issued by the U. S. Government's printing office at Washington. Scope of the book, known as the National Bureau of Standards Handbook H-34, applies to supply lines; communication lines used in connection with supply lines; electrical equipment in central stations, substations and private plants; electrical tests, and electrical work in tunnel subways or similar underground structures.

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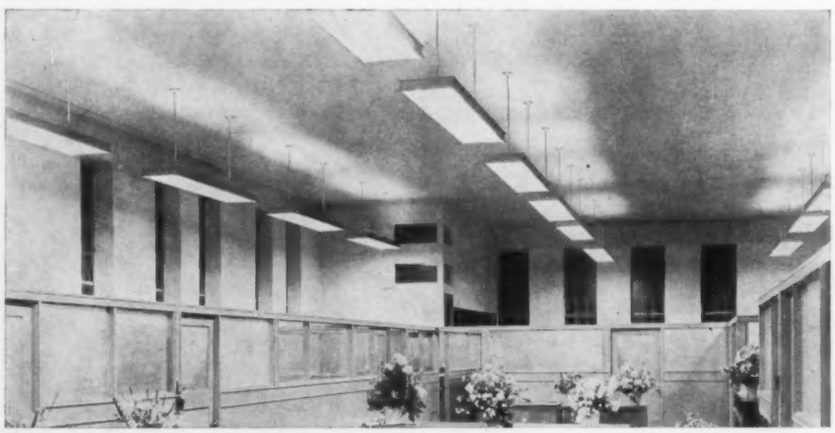
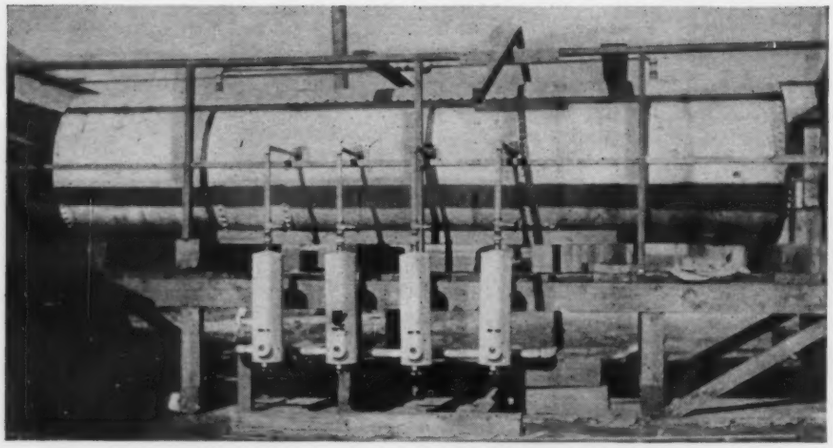
A LARGE-TYPE reprinting of the National Electrical Code for 1937 has been prepared cooperatively by Cutler-Hammer, Inc., Square D Co., Trumbull Electric Mfg. Co. and Westinghouse Electric & Mfg. Co., all licensees of the multi-breaker service and load center. Each page of the code is enlarged to 5½x8 in. The same pagination holds for both the original and this booklet. Wherever the code has provisions relative to services and panels, for which the multi-breaker equipment is permitted or desirable, a sheet of red paper is inserted to emphasize the possibility. The book not only serves to advertise the multi-breakers for the companies, but is also useful to contractors.

Flowers for Fluorescent



Public Service Co. of Colorado's latest and largest fluorescent-lighting installation was made for the Denver Equipment Co., which fittingly celebrated the occurrence by a display of flowers worthy of a florist. Fixtures, eighteen in all, are open with lamps exposed. Slots in top allow for ceiling light. Sixteen fixtures are equipped with three rows of three 36-in. fluorescent daylight lamps; two have three rows of four 36-in. lamps. Reflectors are depressed behind each lamp in order to concentrate as much light as possible downward. Resultant intensity is 30 ft.-candles. Although desk tops are highly polished, there is a marked absence of glare. Clifford Morgan, under the guidance of H. T. Rankin, manager of the utility's commercial lighting division, engineered the entire installation



When siding has been mounted on the framework, this river-boat boiler will be ready to supply hot water at Mandeville Island

Ventilation

For poultry houses is supplied by motor-driven fan and heating unit

With the increasing adoption of battery-type laying and brooding cages, there has been a demand for proper ventilation equipment for poultry houses of the type built to accommodate these batteries. The problem of ventilation becomes more acute in colder weather because of drafts set up by opening windows and doors. A method devised by Puget Sound Power & Light Co. for solving this problem electrically is described in a recent issue of *Agricultural Engineering* by J. C. Scott, the company's agricultural engineer.

While battery brooders have been used for some time, the practice of confining laying hens to individual cages is comparatively new. Poultry men are partial to this new system because it makes it easier to keep individual laying records, reduces the spread of disease, permits more hens to be kept in a given floor area, facilitates culling and prevents bullying of timid hens. At the Sween poultry farm near Woodinville, Wash., the problem of introducing sufficient fresh air into the room and at the same time eliminating drafts and producing an even temperature between floor and ceiling was solved with a specially designed unit incorporating a motor-driven ventilating fan and a 2.5-kw. heating unit.

The unit is set in an opening in the center of the ceiling. A 1,725-r.p.m. motor drives a multi-blade blower below the outlet of which the heating element is placed. Underneath this is a baffle consisting of a flat pan with straight 2-in. sides. The pan, which is larger than the ceiling opening, serves the purpose of a baffle to force the air outward along the ceiling. A damper in the air inlet of the blower permits regulation. This unit will handle 1,100 cu.ft. of air and will provide an air pressure of about ½ in. in a room 24x40 ft. This allows sufficient air to escape through cracks and crevices around the doors so that there is an absence of odor and dampness.

During a 62-day period during December and January when the temperature was below freezing 49 days, the unit had no difficulty in maintaining an inside temperature of 50 deg. F. or higher. Consumption averaged 12 kw.-hr. per day.

A similar unit was tried on a cabinet battery for brooding baby chicks. The brooder room was 10x9 ft. 7 in. with a 6-ft.-6.-in. ceiling. Double walls were filled with shavings for insulation. Small openings 6 in. square were cut in the corners of the room and equipped with dampers for regulating the air changes. Blower capacity was increased to 1,600 cu.ft. per min. Dampers were set to provide 25 air changes per hour with the room filled with chicks. Although the room had a capacity of 3,000 chicks, only 2,000 were brooded. A 90-deg. temperature was maintained for 23 days with an average consumption of 77 kw.-hr. per day. An extremely healthy chick was produced in comparison with those raised in ordinary battery rooms.

Brooder Tents

Arizona poultrymen conduct an experiment which proves feasible

In those sections of the West where climatic conditions are favorable it has been found possible to brood baby chicks electrically in tents instead of in more expensive brooder houses. Tests have been conducted by the Southwest Poultry Experiment Station at Glendale, Ariz., and by various Arizona poultrymen to demonstrate the feasibility of this method. Where climate is mild the system has proved successful and economical due to lower costs.

Tests were conducted with a 12x12-ft. tent which was set upon a wood floor. Around the base of the floor 1x12-ft. boards were mounted for securing the bottom of the tent walls. Openings 10 in. square were provided approximately 1 ft. below the ridge at front and back of the tent for ventilation. Standard-type electric brooders were used. No appreciable difference in mortality or rate of growth was noted between chicks brooded in tents and those raised in brooder houses.

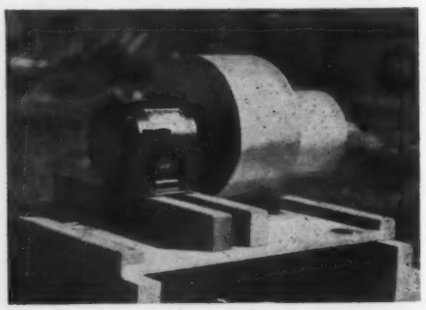
TEST TO DETERMINE whether air-conditioning (provided by an evaporative-type cooler) has any beneficial effect upon the laying characteristics of hens is now under way at the College of Agriculture, University of California at Davis. Since early summer, equal numbers of hens have been living in adjacent houses, one with air conditioning during the summer and the other without. Accurate records have been kept of the number of eggs laid, mortality and other factors. Results will be made public upon the conclusion of the tests, which are being sponsored by the California CREA.

Hot Water

Is supplied on Mandeville Island by river-boat boilers

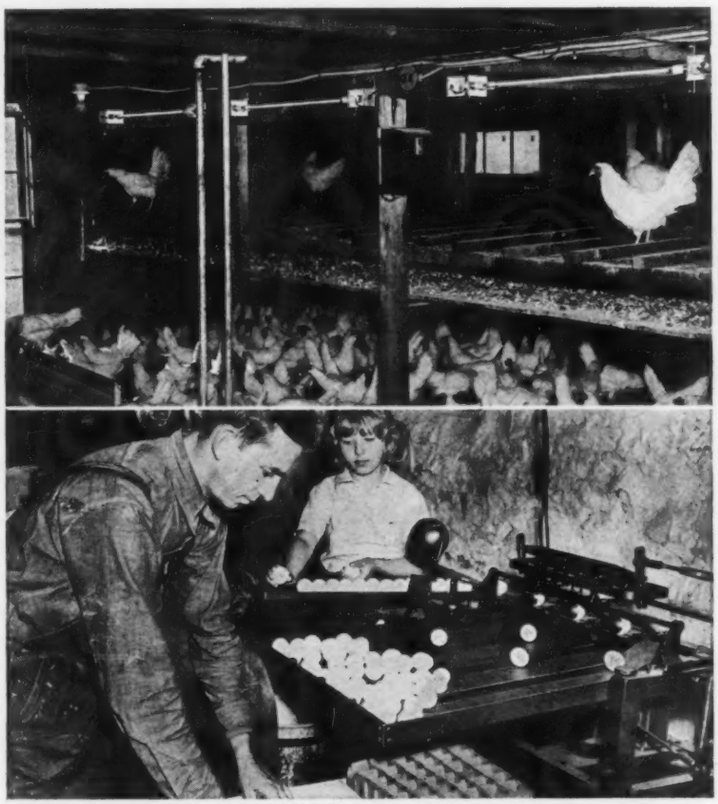
By using abandoned river-boat boilers for hot-water supply, Pacific Gas and Electric Co. was recently able to add 180 kw. of water-heating load to its system.

This job was sold shortly after Mandeville Island Farms, Inc., undertook development of a rich, 5,328-acre delta island in the San Joaquin River for purposes of raising potatoes, celery and



Blower unit which is mounted over an opening in the ceiling of battery laying or brooding room, with 2.5 kw. of heating elements located in a baffle pan beneath the opening

Electrical Aids for Hens



Information for improvement of the West's great poultry industry will undoubtedly come out of the new Westinghouse electric poultry proving farm recently opened at New Hope, Pa. Included among the wide variety of electrical applications on the new farm are the two pictured here. Above is an installation of sterilamps in the hen house. These are designed to kill off bacteria in the air of the room and so prevent the spread of air-borne disease. A similar installation is in the brooder house. Below is an electrically operated automatic egg grader and candler which has a capacity of six to eight cases of eggs an hour.

asparagus.

Last spring the island was flooded. Subsequently four old river boats were purchased. These were first used for reclamation pumping, the paddle wheels propelling the water into a sluice which carried it over the levee.

Later, when six camps were established on the island, the idea of using the boats' boilers for hot-water supply was conceived. Four 7½-kw. Wesix side-arm heaters were installed for each camp, accommodating a minimum of 100 employees.

The hot-water supply will take care of bath houses, cook houses and bunk houses. Eight foremen's houses are supplied separately by a 3-kw. Thermador 30-gal., automatic, insulated unit.

The river-boat boilers, capacity of which varies from 850 to 3,200 gal., were mounted on timber framework. Batteries of electric heaters were installed at the base (see cut). Later, siding was nailed on the frame and the interior filled with saw-dust to a minimum depth of 12-in.

Thus, an inexpensive installation provides the farms with convenient hot-water service.

The job of laying out and selling the installation was done by Douglas Heller, sales supervisor, and H. C. Hopkins, domestic crew captain of P.G.&E.'s San Joaquin Division.

Molasses

How soil-heating cable is used to heat the sticky stuff fed livestock

Application of soil-heating cable to heat molasses to be mixed with feeds is described in a bulletin on handling feed molasses on the farm by J. P. Fairbank and J. R. Tavernetti of the Agricultural Extension Division, Davis, Calif. During cold weather feed molasses is extremely difficult to handle in feed mixers. Most satisfactory temperature range for mixing is between 70 and 100 deg. F.

An effective heating system can be provided by wrapping soil heating cable around the pipe through which the molasses flows. A standard 60-ft. length of cable can be wrapped around 2½ ft. of 2-in. pipe. This will raise the temperature of the molasses about 4 deg. F. with a flow of 1 gal. per minute. For a 2-gal.-per-min. flow to be raised 24 deg. twelve 60-ft. lengths of cable would be required. This could be connected in six 120-ft. lengths to a 220-volt circuit. For maximum efficiency, such an installation should be insulated and protected by a thermostat. Steam pipe insulation is cheap and effective. A thermostat can be placed in the molasses stream through a "T".

Electric immersion heaters are not used for heating molasses directly because the temperature immediately adjacent to the element is too high. They can be used indirectly to heat water, which in turn heats the molasses.

Approval

Has been given the insect electrocutor for grape leafhopper control

Approval has been granted by the California Industrial Accident Commission for the use of the insect electrocutors developed as a project of the California CREA when these devices are mounted with a minimum vertical clearance above ground of 8 ft. In such instances the electrocutor does not have to be equipped with a mechanical guard.

This approval now permits the official publication of recommendations for the use of the light trap as a means of controlling the grape leafhopper. Tests on this vineyard pest have been conducted over a period of five years. At the present time there are 14 installations consisting of 127 light traps covering 200 acres. Sufficient evidence has been gathered from these installations to justify a recommendation for the use of these devices as a sound and economical means of controlling the grape leafhopper. However, the success of this method of control is dependent upon the use of the trap as recommended. Consequently it is necessary to engineer installations so as to avoid improper use due to inadequate equipment or poor construction.

In the meantime additional tests are being conducted on control of the grape leaffolder, the corn earworm and the coddling moth.

PCEA

Completes two regional meetings; makes plans for five more

Having already held large sell-out meetings at Visalia, Calif., Nov. 14 and at Riverside, Calif., Dec. 2, PCEA has completed plans for five more regional meetings during January and February.

Scheduled are sessions at the Elks' Club in Sacramento, Jan. 17; at the Mission Inn, Sonoma, Jan. 18; at the Hotel Saint Claire, San Jose, Jan. 19; at the Hotel Palomar, Santa Cruz, Jan. 20, and at El Paseo, Santa Barbara, Feb. 3.

In each instance the program is approximately the same. It consists of a discussion of the individual's place in the electrical industry by a utility executive, an illustrated talk depicting the business opportunities ahead of the industry and an inspirational address by a speaker from outside the industry.

At Visalia, where attendance was 275, speakers were W. C. Mullendore, Southern California Edison executive vice-president; George C. Tenney, editor of ELECTRICAL WEST, and Dr. Frederick Woellner, of the University of California. At Riverside (attendance: 211) they were L. M. Klauber, San Diego Consolidated Gas & Electric vice-president; Graham Holabird, of National Electric Products Corp., and A. T. Danielson, general sales manager of Barker Bros.

Outside speakers at forthcoming meetings will be Dr. Tully C. Knoles, president of the College of the Pacific, and Dr. Paul T. Cadman, American Research Foundation president.

Contractors

Hold joint meeting with Northern California Chapter, IAEI

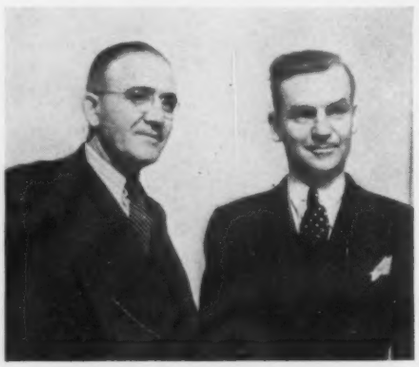
Strong resistance to a proposal to change the state contractors' license law developed in last month's meeting of the Electrical Contractors' Assn. of Northern California.

Reporting on a meeting of the California State Chamber of Commerce, Frank Boyd, of Pacific Electric Motor Co., disclosed that the proposal to change five points in the law was originated by a group of speculative builders in southern California. Upon his motion, it was recommended that the association protest to the state chamber about pushing any such changes without consulting all branches of the construction industry. Roy Butcher, chairman of the State Contractors' License Board, explained that the changes were unnecessary and, in one case, unconstitutional.

Meeting in Sacramento, the contractors joined the Northern California Chapter, International Assn. of Electrical Inspectors, in their morning and luncheon sessions. J. D. O'Connor, of the contractors, presided.

Leo Gianini, Incandescent Lamp Dept., General Electric Co., opened the meeting with a talk stressing the profit possibilities of installing fluorescent lighting equipment. To prove his point, he showed that a wiring job costing from $4 to $15 per ft. was necessary for every linear foot of fluorescent lighting.

Harold L. Gerber, chief electrical inspector of the San Francisco Dept. of Electricity, followed Gianini on the platform. In lieu of approval of new equipment by Underwriters' Laboratories, he said, inspectors must require strict installation performance. He pointed out that in cities where voltage is maintained above 115 volts, performance of the auxiliary, built for 110 to 115 volts, was unsatisfactory. The problem of power factor requires larger wire sizes and switch sizes, he said, cautioning inspectors to rate fluorescent lighting not on the wattage of the lamp but on the wattage of both lamp and auxiliary.



Goold and Ryals—contractors' leaders

At luncheon, Kenneth Ryals, of Stone-Ryals Electric Co., San Francisco, outlined the aims behind the present activity to reorganize the Pacific Coast Electrical Bureau in northern California. Following the lead of the Electrical Development League of Southern California, the industry, he said, is developing an organization for the energetic promotion of adequate wiring, industrial electrical modernization and lighting.

In their closed afternoon session, the inspectors took up problems in panel-board design and code provisions relating to panel-board. A. V. Youens, city electrical engineer of Palo Alto and chairman of the chapter, presided.

Meanwhile, the contractors, after discussing a movement to make contractors pay sales tax at the source of material supply, passed a resolution requesting the State Board of Equalization to assign one tax auditor to electrical contractors in each community and to continue classifying electrical contractors as retailers. It was also resolved that the organization establish closer contact with electrical contractors' associations in southern California.

Electing officers, the contractors chose Ryals to succeed J. D. O'Connor as president. R. Goold, of Eddy Electric & Mechanical Co., Stockton, was elected vice-president. W. A. Cyr, of ELECTRICAL WEST, was reelected secretary-treasurer. Named to join the officers on the executive board were Ted Curry, Fresno; O'Connor, Sacramento; Seth Cohn, San Mateo; Butcher, San Jose, and Harry Eklund, San Rafael.

NWEL&PA

Fourth annual Commercial Cooking Conference held at Spokane

During the first ten months of last year the Northwest power companies added 10,605 kw. of connected cooking load in commercial establishments.

Such was the significant message brought to the fourth general Commercial Cooking Conference of the Northwest Electric Light & Power Assn. at Spokane by D. A. Runyard, of California-Oregon Power Co.

Lewis A. Lewis, of Washington Water Power Co., who opened the three-day session, added further optimistic information. Last year, his company alone credited 12% ($215,000) of its gross commercial revenue to commercial cooking. The rapid growth of this business, he said, was due not only to the spirit of the manufacturers in developing equipment but also to the salesmen in promoting electric cooking in competition with other fuels.

Main feature of the meeting, attended by 77 utility, manufacturing, distributing and advertising company representatives, was a presentation by Jack Welch, of Edison General Electric Appliance Co., Chicago. Welch covered the opportunities for the load, market classification and analysis and selling the profit motive. He wound up his speech with a demonstration of the fry kettle, griddle, broiler and oven used in restaurant cooking.

Other manufacturers' representatives participating in the program were: A. F. Douglas and A. K. Gaylord, F. S. Lang Mfg. Co., talking on their company's new equipment; A. W. Paterson, Edison G. E. Appliance Co., on

new features in the Hotpoint line; R. W. Ray, Fowler Mfg. Co., and Howard Arthur, Arthur & Fowler Co., on water heating in commercial establishments and special commercial heating applications, and Leonard Elder, General Electric Co., and D. Y. Robinson, Montgomery Bros., on special heating equipment and applications in industry. The program on special heating applications was conducted by H. B. Batchelder, Puget Sound Power & Light Co.

What a good, written sales proposal should contain was the subject of a discussion led by Carl Hoffman, Washington Water Power Co. Sales plans and the types of service rendered by various companies to hold existing loads were discussed by Orland C. Mayer, Idaho Power Co. Harvey Brassard, Syverson-Kelley Co., Spokane advertising agency, discussed the place of advertising and promotional plans in the sales picture.

Types of rates in effect in the Northwest for this class of service were analyzed by E. Tysoe, B. C. Electric Railway Co. The plan of the association's Commercial & Industrial Sales Bureau for issuing a series of uniform data sheets on unusual heating, cooking and baking applications throughout the territory was explained by D. O. Bergey, Northwestern Electric Co., and Berkeley Snow, executive secretary of the association.

Presiding at the meeting was C. T. Bakeman, Puget Sound Power & Light Co., chairman of the Commercial & Industrial Sales Bureau. J. A. Lockhart, Pacific Power & Light Co., vice-chairman of the bureau, spelled him during some of the sessions. L. C. Ashton, Washington Water Power Co., was chairman in charge of local arrangements.

Canadian

Electrical Assn. hears some important speeches at Victoria

Speaking before 100 leaders of western Canada's electrical industry, S. P. MacFadden, vice-president of Puget Sound Power & Light Co., last month declared that the average householder is chiefly interested in the highest figure on his electric bill—the rate for the first block of power.

"He generally considers a bill with a maximum rate of 5c a kw.-hr. and a minimum of 4c more reasonable than one with a maximum of 10c and a minimum of 1¼c," MacFadden said.

The only way to meet this problem, he said, is to take the utility's rate story to the customers and explain the situation. Otherwise, the accusations of politicians that power companies enjoy a monopoly not only in the lighting field but also in the commercial-power, domestic-cooking, water-heating and refrigeration fields may have a serious effect on the operations of the companies.

It would not be wise, he declared, to follow the oft-repeated suggestion that power companies average out the cost per kw. to all domestic customers and adopt that as a flat rate without scaling down. To follow this course would mean a complete loss of all the cheap-rate business, such as cooking and water-heating, with a consequent enormous increase of the average rate.

"In most cities the domestic customer who uses current only to the extent of the minimum bill represents a loss to the utility," he said. "In order to compensate for this loss, the bulk use of electricity must be built up until this minimum class disappears."

MacFadden—key speaker

MacFadden's speech was one of the high-spots of the mid-winter meeting in Victoria of the Western Section, Canadian Electrical Assn.

In leading the discussion on the paper, E. N. Horsey, B. C. Electric Railway Co.'s Victoria light and power manager, stressed the fact that electric rates have been made a political football by comparison of the schedules of different companies under totally dissimilar conditions. Rate reductions, he said, could be of two sorts—those that increase consumption and those that simply cut revenue. Reduction of the minimum figure comes in the latter class.

Other speakers and what they said included the following:

A. E. Parker, assistant to the president of Winnipeg Electric Co., and Thomas Myers, publicity manager, B. C. Electric Railway Co., Victoria—Utility advertising on theater programs, free distribution sheets and year books is just as worthless as cooperative advertising in newspapers to celebrate the opening of a new store. Advertising on light bills is useful, but the space could be used to more advantage if it comprised explanation of the manner in which rates are computed.

H. C. Darroch, manager of the appliance division, Canadian General Electric Co., Vancouver, and Patrick Johnson, general sales manager, Puget Sound Power & Light—Storage water heaters, controlled by time clocks or relays, are valuable in levelling off the peaks in power demand. Utilities must destroy the false impression that appliances are costly to use. Electrical equipment may legitimately be financed over a longer period than furniture or automobiles because of its long life. The income group averaging $125 a month is the field now most open for development of appliance sales.

E. E. Walker, B. C. Electric Railway's Vancouver manager of light and power sales—Electrical leagues play a valuable role in uniting all persons in the electrical business and offsetting the political football tendency by providing a united policy.

H. W. Francis, purchasing agent for Canadian Utilities, Ltd., Calgary, Alta.—Salesmen calling on purchasing agents should take up as little of the P.A.'s time as possible. They should not hand out cigars, call the P.A.'s by their first names, tell questionable stories.

Chairman of the local committee in charge of the meeting was W. C. Mainwaring, head of B. C. Electric Railway's merchandising division.

Association Shorts

IES Section outlines program; inspectors' day; cinema society

PROGRAMS PLANNED for future Southern California Section, Illuminating Engineering Society, meetings have been outlined by Program Chairman Henry B. May, Jr., as follows: January—home lighting; February—broadcasting studio illumination; March—Treasure Island lighting effects; April—photocell control; May — street and highway lighting; June—ladies' meeting; August 21-25—national convention; September—stag lighting season opener.

●

INSPECTORS' DAY at the Golden Gate International Exposition has been set for Aug. 17, 1939.

●

CINEMA ILLUMINATING SOCIETY is a new southern California association formed by head electricians of the motion-picture studios for social and educational purposes. Plans call for a monthly dinner-program meeting.

NEWS OF THE INDUSTRY

LOWER BOULDER RATES PROVIDED IN AGREEMENT

Revision of the Colorado River Compact and the Boulder Canyon Project Act aimed at permitting lower power rates from Boulder Dam are provided in an agreement reached by representatives of the seven Colorado River Basin states after a series of conferences at Phoenix. The program culminates efforts initiated almost two years ago by the Los Angeles Bureau of Power & Light and the Metropolitan Water District to secure a reduction in power charges.

The preliminary pact is to be officially ratified at a later meeting in Denver and then will be submitted to the seven state legislatures and to Congress. Its terms include:

(1) Provision of an annual fund of $500,000 by the power contractors (Bureau of Power & Light, Southern California Edison Co., Metropolitan Water District and Nevada-California Electric Corp.) beginning in 1940. Proceeds of this will be devoted for the first three years to a comprehensive survey of the Colorado River Basin. Thereafter annually for 12 years the $500,000 will be allocated to upper basin states to develop their respective projects on the river.

(2) Provision for annual payments of $300,000 each to Arizona and Nevada commencing in 1940 and extending for a period of 47 years.

(3) Reduction of the interest rate from 4 to 3½% or less on the $130,000,000 construction cost.

(4) Abolition of all interest on the $25,000,000 allocated to flood control and the deferment of repayment of this item until the other project costs are amortized.

(5) Resultant reduction of the present power cost of 1.63 mills per kw.-hr. for falling water to approximately 1 mill.

Numerous conferences have been held heretofore in an effort to arrive at a satisfactory compromise with the power contractors, but they have usually ended in open rupture between the various state interests.

SPOKANE HEADQUARTERS of the Bonneville project have been opened in the Old National Bank Bldg. E. F. Banker, former director of conservation and development and also chairman of the Washington Columbia Basin Commission, is in charge of the office.

IMPORTANT TO power companies throughout the West was the Supreme Court's ruling last month that the National Labor Relations Board has jurisdiction over Consolidated Edison Co. of New York. The court held that although the utility operates entirely within New York State it has definite connections with interstate traffic in that it is important to the continued flow of the "stream of commerce."

PLANS FOR BONNEVILLE LINES, STATIONS REVISED

Aiming at completing the Bonneville power network by the 1940 deadline, the Bonneville Administration last month instituted a widespread program for immediate acquisition of 600 mi. of land in Oregon and Washington. At the same time Administrator J. D. Ross announced that the returns of the Nov. 8 power district election would necessitate some revision in the allocation of funds for building transmission lines and substations.

To permit prompt construction of the high-voltage circuits, John C. Fischer, general counsel of the project, requested the U. S. Attorney's office to begin blanket condemnation suits in the federal courts at Tacoma, Portland and Spokane.

Because of the failure of Yakima County, Wash., to pass on a public utility district, Ross said that he will cut the Yakima substation out of the original plan. In Oregon, failure of Wasco County to return a favorable vote on its district proposal will eliminate a proposed transmission line up the Columbia River on the Oregon side from Hood River to The Dalles, Wasco county-seat.

Other Bonneville news was limited to Ross' announcement that bids on installation of lines and substations will be called probably before Feb. 6. Estimate on the work has been set at $3,000,000 and on the materials required at $7,000,000.

Four manufacturers submitted bids on circuit breakers for substations in Portland, Vancouver, Kelso, Salem, Eugene, Hood River and Raymond. Total cost will exceed $300,000.

Kinsey M. Robinson, president of Washington Water Power Co., declared that private power interests will build no more dams in either Washington or Idaho for many years because of the vast amount of power to be generated by Grand Coulee and Bonneville.

PCEA TO COMBINE CONCLAVE AND CONVENTION IN MAY

Pacific Coast Electrical Assn. last month announced that instead of holding a spring conclave in March or April and a convention later it would this year combine the two events in a three-day convention at Del Monte, Calif., May 17-19.

Arrangements are being made to permit approximately as much committee work as would be possible under the former plan. The first day will be devoted entirely to discussion-group sessions of the Business Development, Engineering Economics and Administrative Services Sections. General sessions will be held the following days.

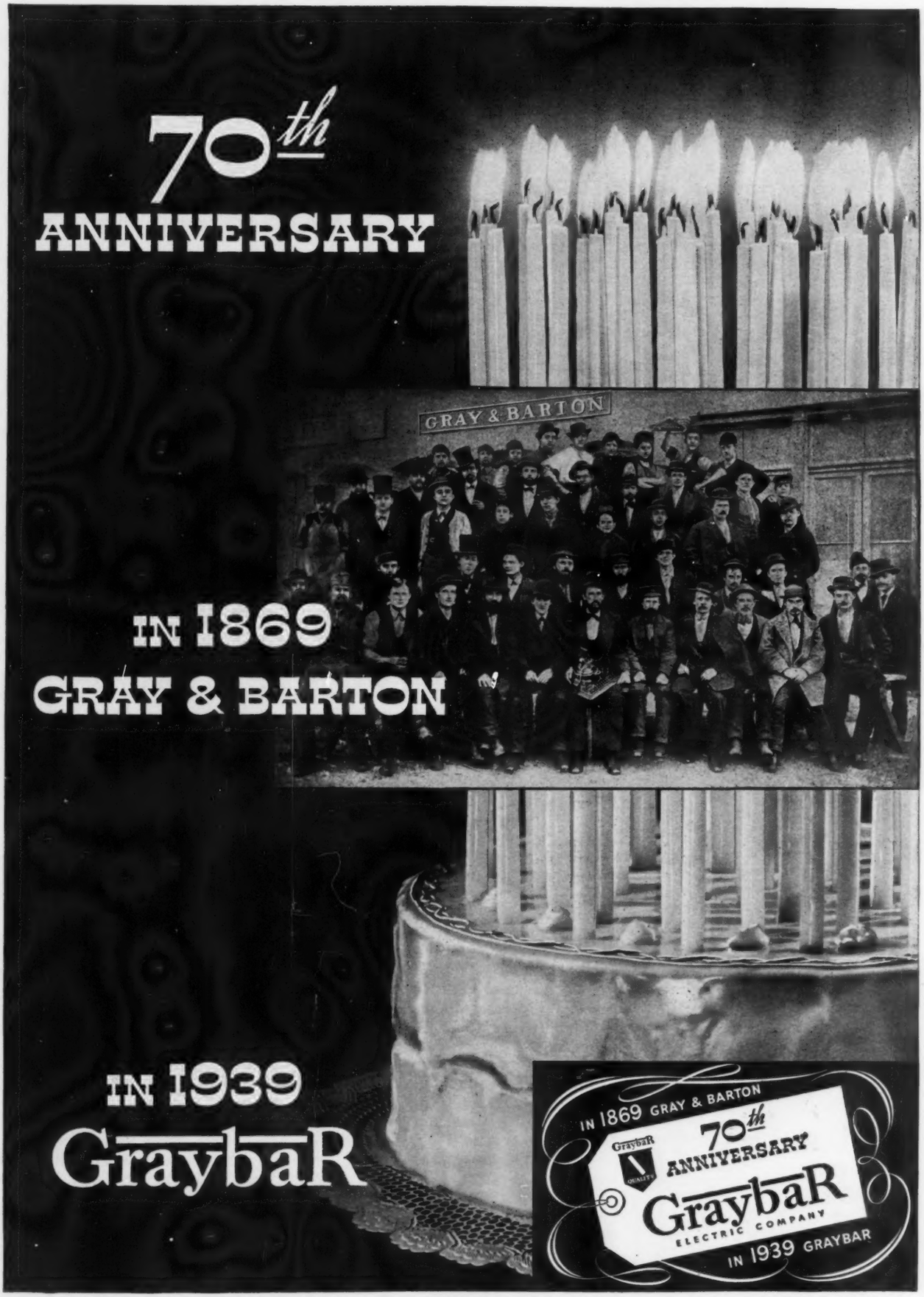
Plans under consideration call for a convention theme built around electricity's part in the industrial development of the West. Study is also being given to the possibility of making the convention a joint meeting with the Northwest Electric Light & Power Assn. and the Rocky Mountain Electrical League. It is believed that the Golden Gate International Exposition will make this proposition attractive to the two organizations.

COURT GIVES COPCO RIGHT TO MANIPULATE KLAMATH

Setting aside the jury's verdict in favor of the complainant, Superior Judge Arthur Coates of Sutter County, Calif., last month held that California Oregon Power Co.'s prescriptive rights to the waters of the Klamath River permitted it to manipulate them to any extent required to generate the power needed.

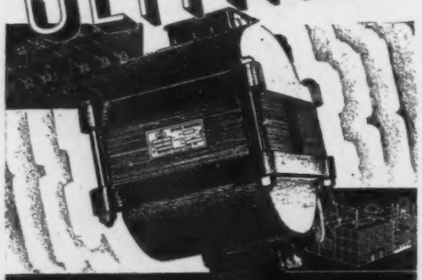
The jury had awarded the complainant, C. F. Moore, a farmer, $7,500 damages. Moore sued for $25,000 on the grounds that manipulation of the water level of the Klamath by opening and closing the gates of the Copco dam had caused depreciation of the farming value of his land and caused him to sell at a loss.

DELIVERY OF POWER from the Lahontan power plant of the Newlands Irrigation Project to Sierra Pacific Power Co. began last month under terms of a temporary arrangement for the interchange of energy. The power company will take available excess energy from the Lahontan plant and will serve the project in any emergency. The arrangement is expected to lead to a permanent agreement.



OFFICES IN 83 PRINCIPAL CITIES FROM COAST TO COAST

JEFFRIES



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1. Elimination of duplicate conduit runs.
2. Saving in power rate.

(Put all of your 110-volt equipment on a 220-volt or 440-volt power circuit, it is economical.)

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FASTER COOKING
EASIER TO CLEAN
UNHARMED BY SPILLOVERS
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with

CHROMALOX
***Super-Speed* RANGE UNITS**

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THE PETERSON COMPANY
1921 Blake St., Denver, Colo.
EDWIN L. WIEGAND CO.
7540 Thomas Blvd., Pittsburgh, Pa.

Ross Proposes Industrial Chamber for Northwest

Bonneville Administrator J. D. Ross last month proposed an industrial chamber of commerce for the power districts and city-owned electric systems of the Northwest.

In a letter to the 104 district commissioners and 50 municipal electric managers of Washington, Oregon and Idaho, Ross outlined a broad program for utilizing Columbia River power for industrial development in the three states. Each district and city was asked to consider a unified plan for stimulating local manufacturing with Bonneville power.

Arguing that there is no reason why residents of the states should pay freight for eastern goods they can process themselves, he wrote: "We logically can expect branch factories for every industry that supplies the Northwest."

Ross said his program for industrial expansion was submitted to the publicly owned power systems because, under the Bonneville Act, they are entitled to preference in the sale of Columbia River power. He urged the commissioners of the three states to unite into one association rather than form separate state organizations.

Pending acceptance or rejection of the idea, Ross went to work on several other fronts.

He met with commissioners of Washington and Oregon PUD's in order to reach some agreement on what tax the districts should pay when they went all the way into the power business. It was understood that Ross favors a uniform rate of taxes for all districts, based on gross revenues from the sale of power, and that he proposes to incorporate this rate in each district's contract for the purchase of Bonneville power.

In Grays Harbor County, Wash., public power commissioners, looking toward eventual purchase of private utilities now serving the county, engaged Ross and his corps of engineers to appraise the properties of Grays Harbor Railway & Light Co. and other companies.

●

CITY OF COEUR D'ALENE, Ida., has been enjoined from proceeding with construction of a municipal power plant unless it is able to comply with Idaho's constitution and laws prohibiting "the incurring of any liability in any manner exceeding the revenue or income" of a public utility in any one year. The city voters had approved a $200,000 bond issue to match a $175,000 federal grant. The court held, however, that the $375,000 total would be inadequate for the project.

WASHINGTON *(McGraw-Hill Bureau)*—Negotiations between the Commissioner of Reclamation and Consolidated Builders, Inc., looking to the installation of heating equipment which will allow construction work on Grand Coulee dam to continue through the winter were in progress last month. If the dam is to be completed in 1940, work must not fall below capacity. The heating would be necessary to protect the concrete against temperatures as low as zero. It was announced, however, that inability to secure delivery on the generators will delay the availability of power until 1941.

●

WASHINGTON *(McGraw-Hill Bureau)*—Until it is known what the City of El Paso, Tex., is going to do about using power from the Elephant Butte power plant, the Bureau of Reclamation cannot complete plans for the Rio Grande project's transmission system. If El Paso purchases the privately owned utility now serving it, it would use practically the entire output of the plant—90,000,000 kw.-hr. of firm power annually. The line to El Paso would be 125 mi. long.

●

Hetch Hetchy Injunction Postponed to Jan. 27

Effectiveness of Federal Judge Michael J. Roche's injunction restraining the City of San Francisco from selling Hetch Hetchy power to Pacific Gas and Electric Co. was postponed last month until Jan. 27. The injunction had originally been made effective Dec. 28.

City attorneys pleaded for the extension on the grounds that the supervisors, in making out their budget, had not taken into consideration the loss of the $2,000,000 annually paid the city by P. G. & E. for the power and that 80 men at the Mocassin power house would be thrown out of work.

Chances of a special municipal election which would decide the problem to the satisfaction of the federal government seemed slim, however. The city controller announced that there were no funds available for holding such an election within the next several months.

●

ENERGIZED LAST MONTH was Seattle City Light's new $5,000,000, 121-mi. Skagit transmission line. The line carries current from the Diablo plant on the Skagit River to the new South substation serving the southern section of Seattle. The old transmission line will continue to deliver current from the Gorge power plant to the North substation.

Los Angeles Bureau to call For Bids on Boulder Line

At the insistence of the Southern California Chapter, Associated General Contractors of America, the Los Angeles Water & Power Commission has adopted a resolution instructing the general manager of the Bureau of Power & Light to call for competitive bids on the construction of the $12,500,000, 260-mi., 275,000-volt Boulder transmission line.

The action, considered of extreme importance to contractors, was taken as a result of the association's efforts to get the commission to stop their day-labor construction of water works and power lines and call for competitive bids and do the work by contract. This day-labor policy had prevailed for 25 years.

●

Oregon Tax Commission Boosts Utility Valuations

Electric utility valuations for tax purposes in the State of Oregon have been boosted nearly 8% for the next biennium. This compares with an increase in other real and personal property valuations of 0.73%.

Total increase of utility valuations, as announced by the state tax commission Dec. 10, is $6,400,000.

Valuation of Portland General Electric Co. and subsidiaries was upped $2,500,000; of California Oregon Power Co., $1,150,000; of Northwestern Electric Co., $800,000, and of Mountain States Power Co., $600,000. Largest percentage of increase was taken by West Coast Power Co., whose valuation was raised approximately 50% from $700,000 to $1,100,000.

●

SIX WYOMING towns were last month given a 10% reduction in commercial and residential rates. They were Lander, Lovell, Greybull, Worland, Thermopolis and Riverton. Company officials estimated the saving would amount to $24,500 yearly. The announcement followed signing of a contract between the company and the Bureau of Reclamation which covers construction of high-voltage lines between Riverton and Thermopolis and between Thermopolis and Gebo. At Gebo the line will connect with existing transmission lines from Shoshone Dam.

●

NANAIMO-DUNCAN UTILITIES, LTD., is erecting a $12,600, 60-kva. substation at Nanaimo, B.C. The company is also constructing a transmission line from Nanaimo to Duncan to serve as a distribution line for new territory.

Plain Hoss Sense
+ good basic quality
+ up-to-date design
= SUPERIOR
REG. U. S. PAT. OFF.
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Crapo Galvanized Wire and Steel Strand can be spliced and served without injury to the heavy, protective zinc coating. The perfect adhesion of this tough, ductile coating to the wire enables it to withstand sharp bending and twisting, produces corrosion-resisting joints, makes for longer life, lower maintenance costs.

Crapo Galvanized Seven-wire Steel Strand and Telephone Wire are readily available in all standard grades and sizes from representative Supply Jobbers.

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All the comforts and conveniences of moder life, which have come to be considered ne cessities, have been made possible by moder refinements in steels. Such refinements i steels do not just happen .... Youngstow maintains a great laboratory and an ex perienced organization, always working wit customers to find the steel best suited to the needs and products.

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YOUNGSTOWN

Vote By Years on Public Utility Districts in State of Washington

Counties Favoring—Black Face; Counties Against—Light Face

Counties Voting on PUD's	PUD's Passed In	1932 Vote For	1932 Vote Against	1932 Vote Majority	1934 Vote For	1934 Vote Against	1934 Vote Majority	1936 Vote For	1936 Vote Against	1936 Vote Majority	1938 Vote For	1938 Vote Against	1938 Vote Majority
Adams		...	...	...	...	...	...	...	...	...	967	1042	75
Benton	1934	...	...	...	1809	1442	367	...	...	...	...	...	...
Chelan	1936	...	...	...	...	...	...	5177	4623	494	...	...	...
Clallam		...	...	...	...	...	...	1780	3954	2157	...	...	...
Clark	1938	...	...	...	...	...	...	4740	9130	4390	9607	6985	2622
Columbia		...	...	...	...	...	...	688	1221	533	1014	1188	174
Cowlitz	1936	...	...	...	...	...	...	6292	5523	769	...	...	...
Douglas	1936	...	...	...	...	...	...	1236	1059	177	...	...	...
Ferry	1936	...	...	...	...	...	...	763	234	529	...	...	...
Franklin	1934	...	...	...	672	558	114	...	...	...	...	...	...
Grant	1932*-1938	175	30	145	...	...	...	...	...	...	2195	861	1334
Grays Harbor	1938	...	...	...	...	...	...	6410	8575	2165	10,395	6539	3856
Island		...	...	...	...	...	...	627	1115	488	651	1536	885
King (rural only)		...	...	...	...	...	...	...	...	...	9683	11,496	1813
Kitsap		...	...	...	...	...	...	...	...	...	5831	6459	628
Kittitas	1936	...	...	...	...	...	...	3426	2131	1295	...	...	...
Klickitat	1938	...	...	...	...	...	...	...	...	...	2219	1920	299
Lewis	1936	...	...	...	...	...	...	6301	5153	1148	...	...	...
Lincoln	1936	...	...	...	...	...	...	2575	1357	1218	...	...	...
Mason	1934	...	...	...	2414	1717	697	...	...	...	...	...	...
Okanogan	1936	...	...	...	...	...	...	4027	1895	2132	...	...	...
Pacific	1936	...	...	...	...	...	...	2383	1712	671	...	...	...
Pend Oreille	1936	...	...	...	...	...	...	1556	679	877	...	...	...
San Juan	1938	...	...	...	...	...	...	462	629	167	740	615	125
Skagit	1936	...	...	...	...	...	...	6173	4971	1202	...	...	...
Skamania	1938	...	...	...	...	...	...	492	888	396	1095	638	457
Snohomish	1936	...	...	...	...	...	...	13,850	10,463	3387	...	...	...
Spokane*	1932*	525	114	411	...	...	...	...	...	...	...	...	...
Stevens	1936	...	...	...	...	...	...	2963	1694	1269	...	...	...
Thurston	1938	...	...	...	...	...	...	4850	5259	409	6672	6413	259
Wahkiakum	1936	...	...	...	...	...	...	625	445	180	...	...	...
Walla Walla		...	...	...	...	...	...	1964	6147	4183	2987	7150	4163
Whatcom	1936	...	...	...	...	...	...	8671	8189	482	...	...	...
Yakima		7702	10,429	2727	...	...	...	11,567	13,187	1620	9484	13,185	3701
TOTAL		8402	10,573	2171	4895	3717	1178	99,538	100,233	695	63,540	66,027	2487

* Small Parcel.

Counties not voting on PUD's—Asotin, Garfield, Jefferson, Pierce, Spokane, Whitman.

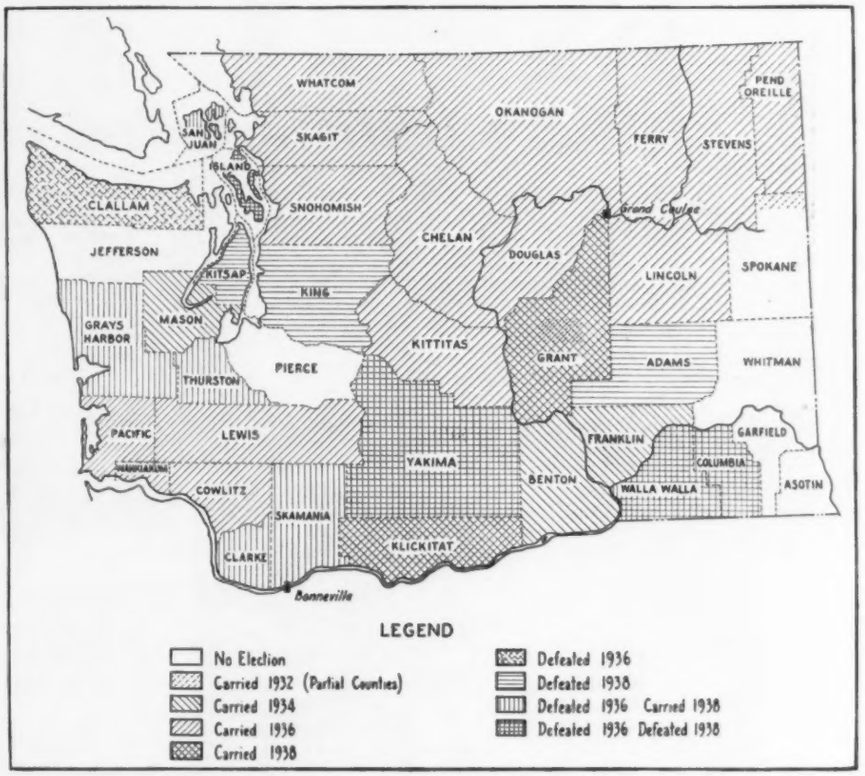
25 Washington Counties Set Up to Go Into Power Business

By virtue of elections in 1932, '34, '36 and '38, two-thirds of the State of Washington and one-third of its population is now set up to go into the power business through public utility districts. Forty-five separate elections have been held in 33 of the state's 39 counties, with the result that there are now 25 counties and one small parcel of a county set up as PUD's.

(Table published herewith shows the votes cast for and against PUD proposals in each of the voting counties in the past four election years. The map shows the present status of the situation.)

The tabulation of the votes indicates the striking closeness of the contests. Those counties voting against PUD's have been in the majority, but in total they represent only 1.14% of the total vote cast in the several separate elections.

The 1938 vote indicates a trend away from the formation of utility districts, which scored their greatest success in 1936 when 15 of 25 counties ballotted in their favor. In 1938, although seven counties favored formation and seven opposed, the population of the PUD counties amounted to 157,128 while the population refusing amounted to 252,966. Majority against the proposal amounted to nearly 2%, as against the average in the four years of only a little more than 1%.



REA Activities

GRAND VALLEY RURAL POWER LINES, INC., Grand Junction, Colo., has awarded a contract to W. O. Allison Co., Grand Junction, for building 38 mi. of line. $37,069.

PUBLIC UTILITY DISTRICT NO. 1, Lewis County, Wash., has awarded a contract to NePage-McKenny Co., Seattle, for building 66 mi. of line. $55,026.

NORTHERN IDAHO RURAL ELECTRICAL REHABILITATION ASSN., Sandpoint, Ida., has been allotted $40,000 to complete the project and to add 15 mi. of line in Bonner County.

Proudly Presenting the SILVER JUBILEE

New! Glass-top Cold Chest... big enough to hold 14 pounds of meat... keeps it fresh and flavorful for days.

New Location for Thermometer... quick, easy-reading... you know exactly how cold the interior is.

The POLARSPHERE... so perfect and trouble-free that it is sealed away forever in a ball of steel. Most efficient of all refrigerating units, it normally runs only 20% of the time... could keep *five* refrigerators safely cold.

TODAY YOU'LL SEE 25 years of pioneering and progress!

Here they are . . . twelve beautiful Silver Jubilee models, priced from $118 . . . absolutely new from flat top to streamlined pedestal. Complete price coverage . . . with values that stand out head and shoulders against any kind of competition!

You can talk beauty . . . and we leave it to you if the Silver Jubilee models aren't the most eye-appealing refrigerators ever created.

You can talk features . . . and those given

KELVINATOR

New! Vegetable Bin . . . amazingly roomy! Convenient, dry storage. Tilts out. Chromium-type handle.
Cold-making Power equal to 1050 pounds of ice a week! Only Kelvinator has the sensational "Polarsphere".
New, Modern Design . . . Wider front, more storage space . . . ends stretching and fumbling about.
Speedy-Cube Release in trays of Magic Metal. New pull-out tabs—easily free tray from sleeve.

above are just the highlights!

You can talk economy . . . and here's where Kelvinator shines! Get the full story on the new Polarsphere, and see why last year's record-breaking performance is being surpassed for 1939.

Here, in our estimation, is the hottest-selling line that ever graced a salesroom. But don't take our word for it—see your distributor and see for yourself!

KELVINATOR, Division of Nash-Kelvinator Corporation, Detroit, Michigan.

ANOTHER SILVER JUBILEE ANNOUNCEMENT

Vital to Appliance Dealers and Retail Salesmen

KELVINATOR Starts Celebration of 25th Anniversary with Founding of NATIONAL SALESMEN'S INSTITUTE

● You would expect this announcement from Kelvinator—the originator of the "Sales Mean Jobs" crusade that swiftly grew into a nation-wide prosperity movement.

George W. Mason, president of Nash-Kelvinator Corporation, believes the greatest need today is better salesmanship. From that belief comes this statement of H. W. Burritt, vice-president in charge of sales of the Kelvinator Division:

"I am privileged to announce the founding of the Kelvinator National Salesmen's Institute, with Sidney Edlund as its president, and known nationally as sales-manager, author, teacher, and co-founder of the 'Man Marketing Clinic'.

"The Institute bids fair to have an immediate influence on increased earning power for the salesman. Dealers, too, will benefit by solving such problems as securing the best sales manpower, keeping that manpower increasingly productive, reducing employment turnover, and reducing sales expense.

"The Institute courses will be open to any dealer, any salesman handling *any* Kelvinator appliance.

"Dedicated to the growth and betterment of the appliance industry, the Institute is an *earned* recognition of the part that has been played—and will always be played—by dealers and retail salesmen in this industry."

H. W. Burritt

Vice-Pres. in Charge of Sales, Kelvinator Division.

Come in and Join

KELVINATOR'S 25TH BIRTHDAY PARTY

PUBLIC UTILITY DISTRICT No. 1, Cowlitz County, Wash., has been allotted $128,000 to build 106 mi. of line in the county.

SOUTHERN COLORADO POWER ASSN., Lamar, has awarded a contract to Driscoll Construction Co., Pueblo, Colo., for building 269 mi. of line in Prowers, Bent and Otero Counties. $221,348.

KITTITAS COUNTY, Wash., public utility district board has applied to REA for a loan to build 107 mi. of main and secondary power lines to serve 285 families in the northern part of the Cle Elum valley.

●

Contracts Awarded

TO WESTERN PLUMBING & ELECTRICAL CO., Butte, Mont., for electrical work on new library at Montana State School of Mines, Butte, $3,794.

TO F. ZIEBARTH, Columbus, Neb., for constructing transmission line from Cheyenne, Wyo., to Gering, Neb., Kendrick Project, $31,823.

TO T. P. SHANE, Bozeman, Mont., for electrical work on four schools in state, $17,988.

TO DECKER ELECTRIC CONSTRUCTION CO., San Francisco, for electrical work at Laguna Honda Home, San Francisco, $53,960.

TO H. C. REID & CO., San Francisco, for electrical work on auditorium building, Golden Gate International Exposition, $29,475. To Abbett Electric Co., San Francisco, for electrical work on exposition's recreational building, $6,512.

TO DELATOUR ELECTRIC CO., San Francisco, for electrical work on new San Francisco recreational facilities, $14,885.

TO E. J. LYNCH ELECTRIC CO., San Francisco, for electrical work on Floriculture Bldg. at Golden Gate Exposition, $8,182.

TO ABBETT ELECTRIC CO., San Francisco, for installing telephone system for San Francisco-Oakland Bay Bridge railways, $16,404.

TO INTERSTATE ELECTRICAL CO., Boulder, Colo., for electrical work on new library at University of Colorado, Boulder, $14,646.

TO NEPAGE-MCKENNY CO., Seattle, for electrical equipment for six U. S. Navy destroyers, $108,891.

TO NEWPORT NEWS (VA.) SHIPBUILDING & DRY DOCK CO. for three vertical-shaft hydraulic turbines for installation in the left power house at Grand Coulee, $1,477,200. To Woodward Governor Co., Rockford, Ill., for three oil-pressure, actuator-type governors with pumping equipment for regulating the speed of the turbines, $67,854.

TO NEWPORT NEWS SHIPBUILDING & DRY DOCK CO. for turbines and governors for the Elephant Butte power plant, Rio Grande project, N. M. and Tex., and same for Green Mountain plant, Colorado-Big Thompson project, $227,963; to Woodward Governor Co., Rockford, Ill., $60,415; to Allis-Chalmers Mfg. Co., $476,331.

TO UNITED CONCRETE PIPE CORP., Los Angeles, and to American Bridge Co., Pittsburgh, for relocation of a section of the Southern Pacific Railroad around Shasta Reservoir, Central Valley project, Calif. Total: $723,011.

TRADE NOTES

Dealers & Distributors

JAGOE ELECTRIC, appliance store of Kerrisdale (Vancouver, suburb), B.C., has been consolidated with Lloyd Brown Electric at 3762 West Tenth Ave., Vancouver. Premises vacated by the Jagoe company at 2178 West 41st Ave., have been taken over by Marshall Electric, located nearby.

●

VACUUM CLEANER SALES, SERVICE & SUPPLY CO., dealer in new and used motors, has been opened in Vancouver, B. C.

●

PARAMOUNT RADIO SERVICE has purchased the radio sales and service business formerly owned and operated in Vancouver, B.C., by William Mallet-Paret.

●

NEIL K. MACDONALD has purchased the business of J. M. Edgar Electric Co., Vernon, B.C.

●

NORTHERN ELECTRIC CO. has opened a new warehouse at Victoria, B.C. George Bresco, Vancouver Island manager for the company, is in charge.

●

COLBY ELECTRIC is the name of a new Victoria, B.C., appliance store opened by A. R. Colby, secretary of the Victoria Electrical Assn. The company, which is Vancouver Island distributor for Charles Branston & Co., will make a special feature of electrical health appliances.

●

WOSK'S, Vancouver, B. C., appliance store, has opened a new branch at Tenth and Main Sts.

●

FORST'S, LTD., New Westminster, B.C., branch, has opened the fourth floor of the building to which it recently moved. Previously, only the first three floors were in use. The new floor, known as the Thrift Department, is used for electrical appliances and furniture traded in on new merchandise.

●

MENZIES HARDWARE CO., LTD., Chilliwack, B.C., appliance store, has renovated its building.

●

R. E. WRIGHT, an employee of Shell Oil Co. for 15 yr., has opened an appliance store at 904 Fair Oaks Ave., South Pasadena, Calif. He handles Hotpoint appliances, G-E ranges, washers and radios and RCA radios. W. A. Hutchins, who was associated with Noel League, proprietor of a G-E store at this location, is Wright's manager. League is establishing his business in Ontario, Calif.

●

PARMELEE-DOHRMANN CO. has opened a new store at Seventh and Olive Sts., Los Angeles. A large department is devoted to appliances and lamps.

●

BARKER'S FURNITURE CO., Fresno, Calif., has opened a new electrical department on its main floor. Opening offer of the department was a $24.75 electric coffee set for $14.75.

●

DANIGER FURNITURE CO., Idaho Falls, Ida., has opened a branch at St. Anthony, Ida. IES lamps are featured.

●

STURROCK RADIO SALES & SERVICE CO., Great Falls, Mont., has been bought by C. O. Burgess. It will be known henceforth as Burgess Radio Repair Service.

●

BILLINGS (MONT.) NORGE CO. has taken over from Montana Power Co. the Royal line of vacuum cleaners. The company is also dealer for Edison Mazda lamps.

●

CENTRAL HARDWARE, Butte, Mont., has taken on a complete line of small appliances, IES lamps and Conlon washers and ironers.

●

TO COMPLETE ITS slogan, "Everything From the Foundation to the Roof," Ketchum Builders Supply, Salt Lake City, has installed an electrical merchandise department. Headed by Rulon Horrocks, the department carries Westinghouse ranges, water heaters, refrigerators and a full line of small appliances.

●

MONTGOMERY WARD has named Bert E. Poulton, Provo, Utah, as Utah County representative for its full line of ranges, refrigerators, etc.

●

C. C. ANDERSON CO. has opened a new department store in Ogden, Utah. The appliance department, featuring G-E merchandise, is under the direction of Sam Brock, who has been associated with the company's Twin Falls, Ida., store. He is assisted by Leland Wright, Bill Evans and Odell Nelson.

●

Contractors

BANKS ELECTRIC REPAIR SERVICE, Vancouver, B.C., installed the wiring system in the Tudor Inn, on the Pacific Highway at the International Boundary. Lighting fixtures were supplied by Gough & Thompson, Ltd., Vancouver.

SELECTIVE AIR CONDITIONS!

"SEE G-E!" That's the tip now spreading rapidly from lip to lip. For the new G-E Refrigerator of '39 is both a beauty and a bargain! Selective Air Conditions, perfected by G-E, give you a new, startlingly simple selling story that catches the interest and carries the quick conviction to your prospect that "G-E is the buy of your life!"

At General Electric Distributors' "Open House" in major cities from coast to coast, the new General Electric line is now being shown to thousands of serious dealers seriously intent on better business for '39. Be sure *you* "see G-E!"

GENERAL ELECTRIC
***Triple-Thrift* REFRIGERATORS**

FIRST
GET THE INSIDE STORY

Many fads and fancies in electric refrigerators come and go but you can continue to be confident that General Electric will be first with time-tested, true contributions that improve service and lower costs. From the "House of Magic" came the two developments most important to modern refrigeration sales and service—the first sealed mechanism and the first all-steel cabinet, both since widely copied. "Research Keeps General Electric Years Ahead"—and it is the policy of General Electric to always protect the public's purse and the dealer's profit.

GO G-E! —ALL THE WAY

A full line of electrical appliances that win public preference through performance. In practically every wired home in America there is a satisfied user of one or more products bearing the famous General Electric monogram.

A complete line of 15 models, including THE NEW G-E THRIFTY SIX!

PROSPERITY YES...
but how soon?

● Send for the Annual BROOKMIRE FORECASTER and Special Report "How the Major Industries will Progress in 1939." Price $1.

In addition you will receive, with our compliments, 3 valuable Brookmire Bulletins covering—Capturing Profits...Common Stock Prospects for 1939 ...$50,000 Common Stock Program...$50,000 Investment Bond Program...The Brookmire List of Approved Common Stocks.

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KEEP AN EYE PEELED FOR

APRIL

and* Electrical West's *Manufacturers' Directory

A valuable source of buying information listing all electrical manufacturers, their Western branch offices and representatives.

STANDARD ELECTRIC, Nelson, B.C., completed the wiring installation in the Occidental Hotel of that city. Jack Hoogerwerf was in charge.

●

RADIO SUPPLY HOUSE, LTD., is a new electrical and radio contractor establishment in Vancouver, B. C.

●

C. C. CARTER, Vancouver, B. C., contractor, has installed interior wiring and lighting fixtures in the new testing station and motor-vehicle building of the provincial government at Vancouver.

●

J. FAREWELL, Vancouver, B.C., contractor, rewired and installed a new lighting system in the West Hotel, Vancouver.

●

PREMIER DUPLEX PARTS & SERVICE, LTD., is a new Vancouver, B. C., firm of mechanical and electrical engineers.

●

ELECTRIC SUPPLY CO. installed lighting equipment in a Livingston, Mont., bowling alley. General illumination of the runways is maintained by commercial lighting fixtures; special reflectors concentrate the light on the pins. Ernie Shelley was in charge.

●

GOGGANS & PENNIE CO., Great Falls, Mont., did the wiring on a new restaurant in that town. Air conditioning was sold by Klemmons & Son.

●

RAFN-MORGAN ELECTRIC CO., Billings, Mont., installed 42 6,000-lumen street-lighting lamps in Hardin, Mont.

●

NORTHERN UTAH ELECTRIC CO., Logan, has been taken over from D. W. Cook and A. Livingston by C. A. May and S. S. Bell. Bert Kendrick has been retained as service man and contract wireman.

●

Manufacturers

FRANK J. AIREY CO., INC., Los Angeles, has been appointed manufacturers' agent for Dean H. Holden, Cleveland lighting specialties manufacturer. The company will cover southern California, Arizona and New Mexico.

●

J. H. MADDOX, San Francisco manufacturers' representative, has been appointed Pacific Coast agent for the Railley Corp., Cleveland, manufacturer of "Pin-it-up" lamps. His territory will consist of Washington, Oregon, California, Arizona, New Mexico and western Texas.

●

WESTINGHOUSE ELECTRIC & MFG. CO. has donated two 25-kw. turbo-generators to Stanford University's mechanical engineering department. The units will be used for instruction and research on methods of utilizing "waste" steam. Nathaniel G. Symonds, vice-president of the company and a Stanford graduate, made the presentation.

●

GRAYBAR'S BUTTE house became a subdivision of the San Francisco district on Jan. 1. In the future it will be under the direction of A. H. Nicoll, San Francisco district manager, who now supervises operations of the Sacramento, Oakland, Fresno, Salt Lake, Butte and San Francisco organizations.

●

GENERAL ELECTRIC is holding a number of tours through its Ontario, Calif., plant in order to acquaint utilities and other companies with its operations and to do an indirect selling job. The trips, confined to small groups, are either in the afternoons or in the evenings (in which case employees come to work at 1 p.m. and work through to 9).

●

SEVENTIETH ANNIVERSARY of Graybar Electric Co. will be celebrated this year. High-spot of the anniversary celebration for which extensive advertising is planned, will be a nation-wide banquet for company employees. These banquets will be held on the same day at the same time in the 83 cities in which Graybar has distributing houses. A book detailing the history of the company and the electrical industry will also be published.

●

Utilities

PUGET SOUND POWER & LIGHT CO. has established a reclamation department at Everett, Wash., for the purpose of reclaiming and reconditioning materials which otherwise would have to be sold as junk. At present the department is manned by a supervisor and three warehousemen.

●

NEW RECIPE SERVICE for Nevada-California Electric Corp. customers has been announced by the company's home economists and consumer magazine, *Valley Homebuilder*. By filling in a coupon in the magazine, a customer can get any desired recipe free.

●

Moved

GENERAL APPLIANCE CO. from the General Department stores, Logan, Utah, to 118 North Main St., Logan.

INDUSTRIAL ELECTRIC CO., Seattle representative for Gardner Electric Mfg. Co., from 1304 Stewart St. to 1276 Denny Way.

PACIFIC COAST REGIONAL offices of Frigidaire

Division, General Motors Sales Corp., from the Financial Center Bldg., San Francisco, to the Western Merchandise Mart. Frigidaire's showroom on the fourth floor of the Mart will be moved to the fifth floor adjoining the regional offices.

CARL M. JOHNSON, North Vancouver, B. C., radio dealer, from 102 Second St. to 1433 Lonsdale Ave.

ABOUT PEOPLE

Franklin T. Griffith Named First Citizen of Portland

Franklin T. Griffith, president of Portland Electric Power Co. and its subsidiaries, Portland General Electric Co. and Portland Traction Co., has been named "first citizen" of Portland for 1938 by the Portland Realty Board.

The citation pointed out that Griffith's services had reached "such a volume that the award of this distinction, long past due, should no longer be postponed." It went on to say that Griffith is "eloquent proof that a big business man can be a blessing rather than a curse to his home community; that it is no crime to be highly successful, and, furthermore, that a man can be a gentleman of charm and dignity, and still get along with thousands of employees on a friendly, cooperative, man-to-man basis."

The yearly award was inaugurated in 1928. Griffith is the first utility man to be honored.

●

Los Angeles Chapter, NECA, Elects C. T. Smallcomb

C. T. Smallcomb, of Smallcomb Electric Co., was last month elected president of the Los Angeles Chapter, National Electrical Contractors' Assn. He succeeeds A. L. Stone, of Stone Electric Supply Co., who was named a member of the executive committee.

Vice-president is J. B. Shamel, Shamel Electric Co.; treasurer, George DeAth, Peerless Electric Construction Co. J. J. Newitt continues as executive secretary.

Other members of the executive committee are: C. J. Bennett, Bennett & Forsberg Electric Co.; James E. Irwin; V. B. Sayre, Commercial Electric Co.; S. F. Hill, Hill Electric Co., and F. M. Vanderlip, Vanderlip's Electric Store.

●

E. A. WHITEHEAD has joined the central station department in General Electric's San Francisco office as a sales engineer on street and highway and floodlighting. Prior to coming to the Coast he spent considerable time in the G-E illumination laboratories, first at Schenectady and later at Nela Park.

At Your Doorstep!

● Save time, expense, correspondence, by making full use of the three complete stocks of NICHROME* and other D-H alloys now maintained on the Coast. You can get WHAT you want WHEN you want it at any of these sales offices.

Electrical Specialty Co., Inc., 316 Eleventh St., San Francisco, Calif.

Electrical Specialty Co. of Southern California, 449-451 South San Pedro St., Los Angeles, Calif.

Electrical Specialty Company, 714 Fourth Ave., Seattle, Wash.

DRIVER-HARRIS COMPANY, Harrison, N. J.

* Reg. Trade Mark U. S. Pat. Off.

NICHROME

WANTED EXPERIENCED MANUFACTURER'S AGENTS

This is one of those really RARE opportunities. The line consists of Safety Switches, Meter and Entrance Switches, Meter Troughs, Fuse Panels, Testing Devices. A big business, firmly rooted in the national fabric — reputation is flawless. Even competitors regard this as the "top" line in its field. Big profits await the agent who can sell!

The man or organization we seek must have a strong following among electrical jobbers and utilities. Be frank in your reply. We promise to be equally frank. Our organization knows about this advertisement.

WRITE TO P.O. BOX 446 CHURCH STREET ANNEX
NEW YORK, N. Y.

★ *For Quick Service on Quality Products from Local Stocks*

Get in Touch with: GEO. E. HONN CO.

420 MARKET ST. SAN FRANCISCO, CAL.

MANUFACTURER'S REPRESENTATIVE FOR:

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BREWER-TITCHENER HARDWARE
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FUSES, CUTOUTS, DISCONNECTS, PROTECTIVE DEVICES
Schweitzer & Conrad, Inc.
CAPACITORS
Cornell-Dubilier Corp.
World's Largest Exclusive Mfgrs. of Capacitors
TRANSFORMERS
Gardner Electric Mfg. Co.
Power and Distribution Transformers
Lee Skipwith & Co., Inc.
Niagara Air-Insulated Current Transformers
CABLE GRIPS
Kellems Products, Inc.
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOISTS
Jasper Blackburn Products Corp.
GROUND LINE POLE TREATMENT
Osmose Corp. of America
METERING INSTRUMENTS
Landis & Gyr., Inc.
CROMPTON TONG TEST AMMETER
Columbia Electric Mfg. Co.
UNDERGROUND TOOLS & EQUIPMENT
T. J. Cope, Incorporated
TREE TRIMMING EQUIPMENT
Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES
Clifton Manufacturing Co.

A. Emory Wishon Awarded Distinguished Service Medal

A. Emory Wishon, president of San Joaquin Light & Power Corp., was last month awarded the Albert Graves Wishon Distinguished Service Medal "in recognition of his unselfish devotion to the company, its employees, customers, communities and the industry."

The presentation marked the 21st time that the medal, established in 1929 in honor of the late A. G. Wishon, founder of San Joaquin Light & Power Corp., has been awarded.

The 20th award was made late in October to Norman Burton, Fresno district groundman, in recognition of his quick action and bravery in saving the life of a lineman during the windstorm of Feb. 9.

●

ELECTED MEMBERS of the various committees of the Public Utilities Section, National Safety Council, have been the following: J. M. Buswell, San Joaquin Light & Power Corp., Fresno—exhibit committee; W. L. Smith, Los Angeles Dept. of Water & Power—film strip committee; William L. Cone, Utah Power & Light Co.—chairman, news letter committee; J. D. Ellis, Northwestern Electric Co.—statistics and contest committee.

●

Sharp Elected President of Utah Electrical League

J. Vernon Sharp, president of Sharp Electric Co., Salt Lake City, has been elected president of the Electrical League of Utah succeeding Will O. Smith, of General Electric Supply Corp.

John Hyde is vice-president and C. A. Wolfrom, secretary. All were elected by acclamation.

New board of directors includes Harry Hall, Frederick C. Wolters, C. O. Drake and Sharp, representing contractors; W. A. Huckins, Ora H. Barlow, Wolfrom and Hyde, representing utilities; Charles F. Wiggs, B. C. J. Wheatlake, Lewis E. Brown and F. N. Wardwell, representing manufacturers; Leland B. Flint, Samuel Rosenfeld, Roy W. Kimberlin and Smith, representing wholesalers; G. Wayne Stillman, T. E. Ashworth, C. W. Gilner and K. L. Olsen, representing dealers.

●

PROMOTED BY Nevada-California Electric Corp. were Virgil E. Jones, to the position of assistant purchasing agent, and A. J. Scott, to general storekeeper. The changes were made necessary by the retirement of Charles B. Lore, general storekeeper.

D. M. SALSBURY, Salt Lake City manager of Westinghouse Electric Supply Co. for the past 5½ yr., was last month transferred to the Northwest territory as district manager. He succeeded the late Hugh L. Bargion. Salsbury has been with the company for 21 yr. Prior to going to Salt Lake, he was sales manager in the San Francisco district. E. J. Duggan, San Francisco office manager for the company, succeeded Salsbury at Salt Lake. R. F. McDonald became San Francisco office manager; Clyde Williams, San Francisco supply sales manager.

●

Idaho Power Promotes Seven General-Office Employees

Seven general-office employees of Idaho Power Co. were recently promoted. They were:

E. A. Olsen, to assistant commercial manager; M. M. Ilch, formerly in the Pocatello office, to chief clerk of the accounting department; J. B. McLain, to general storekeeper; J. C. Baldridge, to dealer sales representative, and J. O. Malvin, to purchasing agent.

Assistant Treasurer George E. Barnard was given the responsibility of the treasury department, while Assistant Treasurer V. T. Montgomery was put in charge of accounting and statistics.

●

SAM G. HEPLER, Seattle, has been elected to succeed R. C. Kenny, Portland, as a member of the National Electrical Contractors' Assn.'s labor relations committee for Division 10. He represents Washington, Oregon, Idaho, Montana, Wyoming and Utah.

●

FRED J. HUME, president of Hume & Rumble, Ltd., Vancouver and New Westminster, B. C., has been reelected mayor of the City of New Westminster for his sixth successive term. William Mott, of Mott Electric, New Westminster, has been reelected alderman.

●

LADNER V. ROSS, illumination engineer for Washington Water Power Co., has been placed in charge of illumination for the Washington state exhibits at the San Francisco and New York fairs.

●

R. E. FISHER, Pacific Gas and Electric Co.'s vice-president in charge of public relations and sales, has been appointed chairman of the new state-wide committee on shipbuilding and ship operation of the California State Chamber of Commerce.

●

RICHARD CARROLL is new manager of home appliance department of the D. J. Cole Co., Billings, Mont.

Cole to Lead Los Angeles Ben Franklin Club

A. J. Cole, of McGraw Electric Co., has been elected president of the Los Angeles Ben Franklin Club. He succeeds Will H. Davie, of Allied Industries.

Named first vice-president was E. I. Hannah, Maydwell & Hartzell, Inc.; second vice-president, W. C. Caffray, Electric Sales Co.; secretary, Graham Holabird, National Electric Products Corp.

Directors are K. M. Anderson, F. J. Airey, H. D. Burns, S. P. Larsen and Davie.

●

C. H. GUEFFROY, for many years associated with Pacific Power & Light Co. and Portland Gas & Coke Co., has been appointed assistant to the president of the former company. He will carry the work in addition to his work as assistant to the president of the gas company. He succeeds E. F. Pearson, who has gone to Northwestern Electric Co. as assistant to the president.

●

CLAUDE R. KINGSBURY has been named to take over Ohio Brass Co.'s Northwest territory, with headquarters at Seattle. He succeeds J. W. Watkins, who has left the company. Kingsbury was formerly in the company's Mansfield, Ohio, plant, where he devoted himself to street railway and trolley coach engineering.

●

Short Succeeds Kay as Head of IAEI Section

Meeting in Ontario, Nov. 30, the Southern California Section, IAEI, elected Frank A. Short, electrical engineer for the Industrial Accident Commission, State of California, and former president of the Southwestern Section, IAEI, chairman for 1939. He succeeds A. J. Kay, of Anaheim.

Herbert G. Ufer, Pacific Coast superintendent of Underwriters' Laboratories, was reelected secretary.

Host at the meeting was John Peterson, city electrician of Ontario. Next meeting, to be held in San Diego, Feb. 1, will be in charge of A. E. Johnstone, city electrician.

●

F. H. DOREMUS, manager of General Electric's industrial department in the Rocky Mountain District, has taken on new duties as manager of the company's transportation department for that region.

●

A. H. SMITH, of Spokane, has been appointed manager of the electrical appliance department of Montgomery Ward, Missoula, Mont.

41,000,000 Sapphires

FOR WESTINGHOUSE BALL and JEWEL LIFETIME BEARINGS

Over 41,000,000 sapphires have been used in Westinghouse Meter Bearings. For 36 years every Westinghouse Meter has been made with the famous Ball and Jewel Bearing—the only lifetime bearing—never requiring lubrication or replacement.

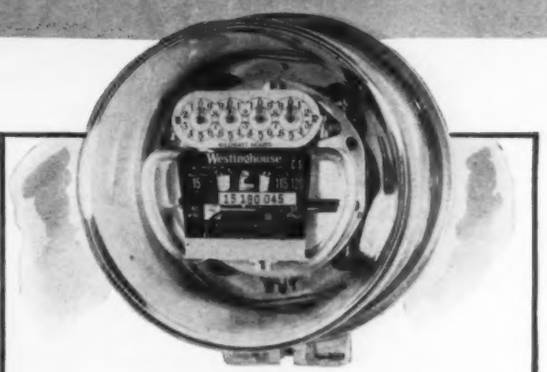
Lifetime Bearings give you Money-Saving Long Time Accuracy

True meter cost is cost per year — not first cost. Because Westinghouse Meters do not require periodic replacement of bearings, or frequent adjustments, they are money-savers for power companies.

It's no great feat to build a meter that has initial accuracy. But Westinghouse Meters are built to retain that initial accuracy for years, without attention or extra expense.

Proof? Any Westinghouse man will be glad to show you how Westinghouse Meters have contributed to lower metering costs.

J-40199



WHY WESTINGHOUSE METERS *give you* LONG TIME ACCURACY

1 Lifetime Bearings—no lubrication, no replacement.

2 Gold Plated Register—no corrosion to cause friction.

3 One-piece Electromagnet—fixed performance characteristics.

4 No Mechanical Adjustments—permanent, long time accuracy assured.

Westinghouse *Long Time* Meters

W WESTINGHOUSE ELECTRIC

Robitscher Reelected By Pot and Kettle Club

Earl M. Robitscher, retired manufacturers' agent, has been reelected president of the San Francisco Pot and Kettle Club for the next six months.

Also elected by the club, an organization of distributors of housewares and electric table appliances, were: Bruno Kaufner, Hazel-Atlas Glass Co., first vice-president; W. H. Spaulding, Hale Bros., second vice-president; Frank Overbeck, Dunham, Carrigan & Hayden Co., third vice-president; George A. L'Amoreaux, Western Merchandise Mart, corresponding secretary; L. W. Sauer, Baker-Smith Co., recording secretary, and D. J. Bartelme, Bart-Kinnison Co., treasurer.

Directors are H. S. Baker, R. L. Harkness, J. Sloss Jr., Sidney Zobel, A. R. Nisely, Phil Seagrave, Fred Sanford, Hans Weber, W. A. Trachsel and A. R. Auger.

●

J. L. BURKHOLDER, assistant general manager of the Metropolitan Water District of Southern California, has resigned to assume new duties as chief of the Division of Engineering, American Section, International Boundary Commission.

●

Deaths

C. B. HAWLEY, 67, pioneer electrical figure in the Intermountain district, committed suicide in his Salt Lake City home Dec. 18. Illness is believed responsible. One of the organizers of the Intermountain Electric Co., which Westinghouse Electric Supply Co. purchased some years ago, Mr. Hawley had just been appointed Salt Lake district manager for Westinghouse Supply. A native of Salt Lake, he had been president of the Utah Tuberculosis Assn. for nine years. He was also past chairman of the Pacific Division, NEWA; past chairman of the Salt Lake Traffic Committee, and past president of the Utah Outdoor Assn., the Salt Lake Chamber of Commerce and the Rotary Club.

●

HUGH L. BARGION, 50, district manager of Westinghouse Electric Supply Co., Seattle, died Nov. 26. Mr. Bargion had been connected with the electrical industry for 33 yr. He started as office man for the Montana Electrical Co., Butte; transferred to the sales force, and finally became manager. Later he moved to Spokane as manager of the Washington Electrical Supply Co. In 1934, when Westinghouse took over the two companies, he was named district manager at Seattle for Washington, Oregon, Idaho, Montana and Alaska. He was an active member of the Electric Club of Washington.

●

FRANK R. NICHOLAS, 66, chief right-of-way agent for Seattle City Light, fatally shot himself Dec. 1. A graduate of Massachusetts Institute of Technology, he had been associated with the department for 21 yr. Prior to going to Seattle, he was state engineer of Nevada.

●

MAYNARD STAMPFLI, general manager of H. Saviers & Son, Reno and western Nevada electrical dealer, died of heart attack. Phenomenal range and refrigerator sales are credited to his work for the firm. Prominent in local affairs, he had just before his death accepted the presidency of the local Kiwanis club.

●

SAM CURTIS, retired chief electrical inspector of the San Francisco Dept. of Electricity, died late in November. A veteran inspector connected with the department for approximately 30 years, Mr. Curtis gave up the chief inspectorship two years ago because of illness.

●

DONALD JAMES MCINTYRE, 56, owner and manager of Indian Valley Light & Power Co., Greenville, Calif., died Nov. 29 after a brief illness.

●

HERBERT S. BARBER, former chief clerk of Nevada-California Electric Corp.'s auditing department in Riverside, died of sun-stroke. Mr. Barber retired from the company in 1936 after 27 yr. of service.

●

Speakers

At training sessions held in Butte and Great Falls for Montana Power Co.'s home service advisors—W. E. Potter and D. A. Pearson, General Electric; William F. Brown, Markel Electric Products, Inc., Chicago; L. E. Larson, Silvray Lighting Co., Chicago; G. B. Hammond, General Electric Supply Corp., and R. O. Kerr, I. L. Comstock, Clark Davis and Cecil Kirk, Montana Power.

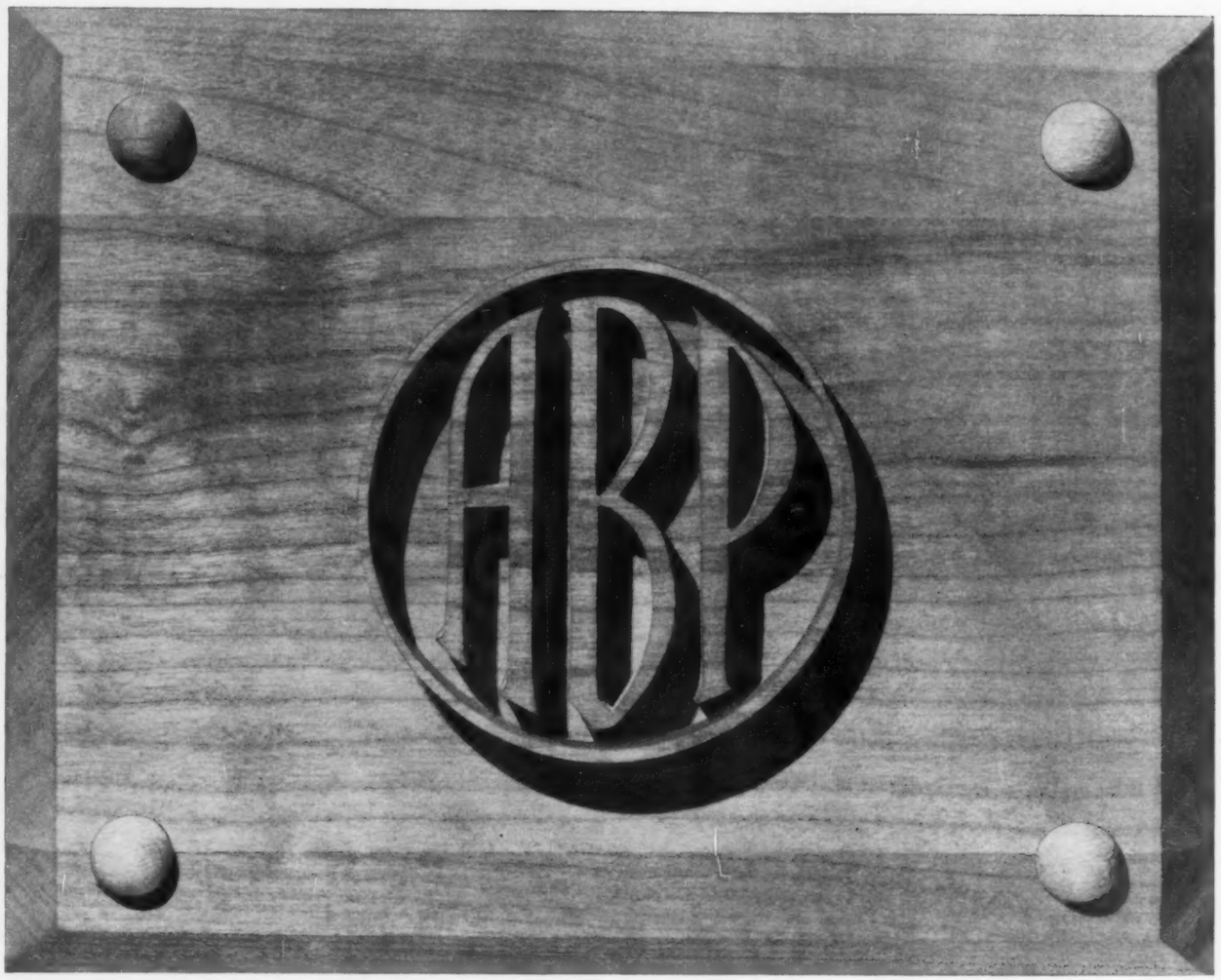
At past and future meetings of the Vancouver Section, American Institute of Electrical Engineers—(Dec. 5) F. J. Bartholomew, C. Arnott, W. Choate, A. Vilstrup, T. F. Hadwin and J. H. Steede: in a debate, "Resolved, That within the next five years air-circuit breakers will be purchased to a greater extent than oil-circuit breakers in Canada for system voltages 2,300 to 200,000 volts;" (Jan. 9) Harold D. Smith, Dept. of Physics, University of British Columbia: "Industrial Applications in the Field of Low Temperature;" (Feb. 6) N. F. Pullen, B. C. Telephone Co.: "The Private Life of Dials and Doodads;" (May 1) J. A. Tames, Canadian Westinghouse Co.: "The Development of Modern Methods of Controlling Electrical Apparatus."

At a joint meeting of the Southern California Section, IES, and the Los Angeles Section, AIEE—Alston Rodgers, illuminating engineer, General Electric: "Light Sources;" George M. Rankin, director of lighting, Southern California Edison Co.: "Lighting Applications."

Every Monday until June before the home economics and general science classes in the Los Angeles High School system—Frank W. Loomis, chairman of the publicity committee, Southern California Section, IES: "Home Lighting." On Tuesdays Loomis instructs the junior class at the Los Angeles School of Optometry in a year-long course in the fundamentals of applied illumination.

At a sales conference for employees of Northwestern Electric Co. and Pacific Power & Light Co. and associated dealers, jobbers and contractors in the Portland area—L. T. Merwin, president; George H. Wisting, assistant general manager in charge of sales, and J. B. Buman, manager of residential and farm sales bureau, all of Northwestern Electric; Paul B. McKee, president, and L. A. McArthur, vice-president of Pacific Power; S. G. Ward, Portland manager, Graybar Electric Co.; Arnold Kuhnhausen, Kuhnhausen Electric Sales & Service Corp., Portland; Harry Zavin, Star Furniture Co., Portland; R. H. Fite Jr., G. W. Hart, K. M. Montgomery, R. F. Pabst, P. D. Brooks and R. V. Bauer, sales consultants of the commercial department of Ebasco Services, Inc., New York; L. Jennings, appliance and merchandise department, General Electric, New York; S. G. Hibben, merchandise division of Westinghouse Electric & Mfg. Co.; E. D. Stryker, Incandescent Lamp Dept., G-E, Nela Park, and F. H. Harrigan, Northwest field representative, Modern Kitchen Bureau. The same group of Ebasco men and eastern representatives also held programs in conjunction with Pacific Power in Yakima, with Washington Water Power Co. in Spokane and with Montana Power Co. in Butte.

At a three-day conference for all Pacific Gas and Electric Co. commercial lighting supervisors and salesmen—Morris Hixson, Leo Gianini, Walter Carlson and Carl Allen, all of the Incandescent Lamp Dept., General Electric Co.; W. P. Bear, P. G. & E., and O. R. Doerr, chairman of the commercial committee, P. G. & E.



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PROFILES OF THE MONTH

General staff of the ironer test campaign in San Jose, Calif., consisted of (left to right) Bert Reynolds; Ross Van Gundy; C. H. Williams; C. R. VanSant, chairman of the committee, and George Dickie

Portland office of North Coast Electric Co. is now under the management of Harry Byrne Jr., vice-president of the company. Recently transferred from Seattle, he takes over an organization of 24 employees

E. D. Hotaling is the new head of Apex-Rotarex Corp.'s sales organization in the West. His promotion from the sales managership came when G. B. Schuyler was named executive vice-president

Arthur Rowe, chairman of the San Francisco Electrical Development League's kiddies' committee for the past 25 years, beams upon the audience as he greets St. Nicholas (W. A. Cyr, of Electrical West) at the league's annual celebration

In active charge of constructing catenaries, third-rails, feeders, etc., on the $18,000,000 Bay Bridge electrification was Henry M. Tilson, electrical engineer for the bridge

Interest in rural electrification brought this group together at a recent California CREA meeting. Standing (left to right) are A. D. Bragg, General Electric Co.; K. F. McIntire, CREA engineer; J. B. Benson, Fresno County Farm Advisor; K. R. Frost, University of California; E. G. Stahl, San Joaquin Light & Power Corp., J. R. Lazarus, PCEA field man; Floyd Smith, University of California; W. H. Park, Pacific Gas and Electric Co.; J. P. McElroy, San Joaquin Light & Power Corp.; C. F. Dalziel, University of California; M. W. Phillips, Southern California Edison Co.; V. A. Bloxham, Southern California Edison Co.; J. R. Tavernetti, University of California; George C. Tenney, Electrical West; Ben D. Moses, University of California, CREA secretary. Seated (left to right) are Roy A. Wehe, California State Railroad Commission; J. J. Deuel, California Farm Bureau Federation; B. M. Woods, University of California; R. C. McFadden, Southern California Edison Co.; J. K. Ellsworth, University of California; H. B. Walker, University of California, CREA chairman, and W. J. Delehanty, General Electric Co. Meeting place was Fresno. (See Electrical West, Dec. 1938.)

WE'RE GETTING IN LINE

for '39

Pacific Gas and Electric Company sees a New Year bright with promise. With more salesmen, more and better merchandise, more advertising and more dealer sales promotion, we confidently expect business to be good—and we look forward to a larger measure of cooperation between ourselves and our dealer associates than ever before.

Let's shine in '39—Electrically!

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Owned, Operated, Managed by Californians

MORE OUTLETS NEEDED

In spite of the great public acceptance of electric conveniences, too many homes are built today without the facilities for enjoying them. We spend hundreds of dollars on other appointments and then skimp on the vitally important subject of wiring.

This lack of outlets acts as a brake on the entire industry. It limits the contractor's volume,—it prevents the sale of many appliances because the home-owner doesn't have the facilities for using them,—it cuts down the utility's revenue from the sale of electric current.

More Outlets In Use should be the electrical industry's slogan for 1939. It is a common goal in which we all share the benefits.

PACIFIC COAST *Electrical* BUREAU

447 SUTTER STREET, SAN FRANCISCO • 601 WEST 5TH STREET, LOS ANGELES